INPUT DATA, REFERENCES, AND NOTES

UCRL-8030, August 1966 Revision

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This document includes:

1. Index and Listings of input data and references.
2. Notes on individual stable particles, meson resonances, and baryon resonances, in that order.

After the XIII High Energy Conference (in Berkeley) we intend to revise UCRL-8030 and submit it to Review of Modern Physics. Accordingly we earnestly solicit comments. All the authors can be found at LRL extension 5001 (Alvarez Group).

The Input Data and References for Stable Particles and Baryons are reasonably up to date. We got to Mesons last, and apologize that they are not complete.

Index to the Particle Listing

In the summary tables, data listings, and references, we have ordered the particles as below. The ordering is fairly natural: for stable particles, merely by mass; for resonances, according to B, |S|, I, and M. Our bookkeeping number assigned to each particle (e.g., the ϕ meson is "U 4") is essentially arbitrary.

Stable particles	Meson resonances		Baryon resonances	
γ	†$\sigma(390)$	†$\pi\pi\pi(1630)$	$N^*(1400)$	$Z_0(1865)$
ν_e	†$S^0(720)$ or ϵ^0	†$\pi\pi(1670)$	$N^*(1570)$	†$Z_1(1910)$
ν_μ	$\omega(783)$	$S(1930)$	$N^*(1518)$	
e	$\eta'(958)$ or X^0	$T(2200)$	$N^*(1700)$	$Y_0^*(1405)$
μ	†$H(975)$	$U(2390)$	$N^*(1688)$	$Y_0^*(1520)$
$\pi^\pm$	$\phi(1019)$		$N^*(1688)$	$Y_0^*(1670)$
π^0	$K\bar{K}_0(1068)$	$\kappa(725)$		$Y_0^*(1815)$
$K^\pm$	$f(1254)$	$K^*(892)$	$N^*(2190)$	$Y_0^*(2110)$
K^0	$D(1286)$	$K_C(1215)$	$N^*(2650)$	†$Y_0^*(2340)$
K_1^0	$E(1418)$	$K\pi\pi(1320)$	†$N^*(3030)$	
K_2^0	$f'(1500)$	$K^*(1400)$	†$N^*(3245)$	$Y_1^*(1385)$
η		$K\pi\pi(1800)$		$Y_1^*(1660)$
p	$\rho(756)$	†$K^*_{3/2}(1175)$	$\Delta(1236)$	$Y_1^*(1760)$
n	$K\bar{K}_1(1003)$	†$K^*_{3/2}(1270)$	$\Delta(1670)$	$Y_1^*(1915)$
Λ	$A_1(1080)$	†$K^+K^+(1055)$	$\Delta(1920)$	$Y_1^*(2035)$
Σ^+	$B(1220)$	$K^+K^+(1280)$	$\Delta(2420)$	†$Y_1^*(2260)$
Σ^-	$A_2(1300)$		$\Delta(2850)$	
Σ^0			†$\Delta(3230)$	$\Xi^*_{1/2}(1530)$
Ξ^-				†$\Xi^*_{1/2}(1705)$
Ξ^0			†$N^*_{5/2}(1570)$	$\Xi^*_{1/2}(1820)$
Ω^-				$\Xi^*_{1/2}(1933)$

†Omitted from summary tables.

DATA FOR TABLES ON STABLE PARTICLES

STABLE MEANING IMMUNE TO STRONG DECAY

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CODE    EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS    DATE
   ABOVE BACKGROUND                                                      PUNCHED

     N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS
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γ

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                      0 GAMMA (0,J=1)
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ν_e

```
                      1  E-NEUTRINO  (0,J=1/2)

                      1  E-NEUTRINO  MASS (KEV)

S 1M   *  LESS THAN              0.25    LANGER    52 CNTR
S 1M   *  LESS THAN              0.15    HAMILTON  53 CNTR
S 1M   *  LESS THAN      0.55 +OR- 0.28  FRIEDMAN  58 CNTR
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ν_u

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                      2  MU-NEUTRINO  (0,J=1/2)

                      2  MU-NEUTRINO  MASS (MEV)

S 2M   *         3.5   OR LESS            BARKAS    56 EMUL
S 2M   *         4.0   OR LESS            DUDZIAK   59 CNTR
S 2M   *         3.6   OR LESS            FEINBERG  63 RVUE                       7/66
S 2M   *         3.0   OR LESS            ALLCOCK   65 RVUE                       7/66
S 2M   *         2.5   OR LESS            BARDON    65 SPRK
S 2M   *         2.1   OR LESS            SHAFER    65 CNTR  CONF LEV = 68PCT     7/66
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e

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                      3  ELECTRON  (0.5,J=1/2)

                      3  ELECTRON  MASS (MEV)

S 3M           0.511006 0.000002          COHEN     65 RVUE
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                   3  ELECTRON LIFETIME (UNITS 10**21 YR)

S 3T   *      OVER                 2.0    MOE       65 CNTR                       6/66
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                      3  ELECTRON MAGNETIC MOMENT(E/2ME)

S 3MM  *     1.00116C9 .0000024           SCHUPP    61 CNTR  -
S 3MM        1.001159622  +-(27)*10**-9 WILKINSON 63 CNTR -                       8/66
S 3MM  *     1.001168 0.000011            RICH      66 CNTR +  POSITRON           8/66
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μ

```
                      4  MUON  (106,J=1/2)

                      4  MUON  MASS (MEV)

S 4M           105.659    0.002           FEINBERG  63 RVUE
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                      4  MUON LIFETIME (UNITS 10**-6)

S 4T             2.200    0.015    0.015 FISHER    59 CNTR
S 4T             2.225    0.006    0.006 ASTBURY   60 CNTR
S 4T             2.211    0.003    0.003 REITER    60 CNTR
S 4T             2.208    0.004    0.004 TELEGDI   60 CNTR
S 4T             2.203    0.004    0.004 LUNDY     62 CNTR
S 4T             2.198    0.001    0.001 FARLEY    62 CNTR
S 4T             2.202    0.003    0.003 ECKHAUSE  62 CNTR
S 4T             2.197    0.002    0.002 MEYER     63 CNTR +
S 4T             2.198    0.002    0.002 MEYER     63 CNTR -                      7/66
--------------------------------------------------------------------------------

                      4  RATIO OF LIFETIME OF MU+ TO MU-

S 4LR            1.000    0.001           MEYER     63 CNTR  LIFETIME MU+/MU-     7/66
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                      4  MUON PARTIAL DECAY MODES

S 4P1     MUON INTO E (E-NEU) (MU-NEU)                          S 3S 1S 2
S 4P2     MUON INTO E 2GAMMA                                    S 3S 0S 0
S 4P3     MUON INTO 3ELECTRONS                                  S 3S 3S 3
S 4P4     MUON INTO E GAMMA                                     S 3S 0
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                      4  MUON  BRANCHING RATIOS

S 4R1  *  MUON INTO  E+2GAMMA  (IN UNITS OF 10**-5)        (P2)/(P1)
S 4R1  *  LESS THAN             1.6      FRANKEL 1 63 SPRK

S 4R2  *  MUON INTO 3E (IN UNITS OF 10**-7)                (P3)/(P1)
S 4R2  *  LESS THAN             5.0      PARKER 1  62 CNTR
S 4R2  *  LESS THAN             1.3      ALIKHANOV 62 SPRK
S 4R2  *  LESS THAN             1.5      FRANKEL 2 63 CNTR
S 4R2  *  LESS THAN             1.45     BABAEV    63 SPRK


S 4R3  *  MUON INTO  E+GAMMA  (IN UNITS OF 10**-8)         (P4)/(P1)
S 4R3  *  LESS THAN             1.2      FRANKEL 1 63 SPRK
S 4R3  *  LESS THAN             0.6      PARKER 2  64 SPRK
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                      4  MUON  MAGNETIC MOMENT (IN E/(2*MUON MASS)

S 4MM          1.001162 0.000005         CHARPAK   62 CNTR
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$\pi^{\pm}$

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                      8  CHARGED PION  (140,JPG=0--)  I=1

                      8  CHARGED PI  MASS (MEV)

S 8M   *        139.37    0.20            CROWE     54 CNTR  -
S 8M   *        139.68    0.15            BARKAS    56 EMUL +
S 8M            139.577   0.014           SHAFER    65 CNTR                       6/66
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                      8  PI+ MU+ MASS DIFFERENCE (MEV)

S 8D             34.00    0.076           BARKAS    56 EMUL
S 8D             33.89    0.076           BARKAS    56 EMUL
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                      8  CHAR.PI LIFETIME (UNITS 10**-9)

S 8T   N         25.6     0.5      0.5    CROWE     57 RVUE
S 8T   N         25.6     0.8      0.8    ANDERSON  60 CNTR
S 8T   N 8000    25.46    0.32     0.32   ASHKIN    60 CNTR +
S 8T   N                                  MERRISON   62 RVUE
S 8T             26.01    0.02            ECKHAUSE  65 CNTR +                     6/66
S 8T   N         25.6     0.3             BARDON    66 CNTR                       6/66
S 8T   N         25.85    0.35            DUNAITSEV 66 CNTR                       6/66
S 8T             26.40    0.08            KINSEY    66 CNTR +                     6/66
S 8T   N  FOR RECOMMENDED LIFETIME SEE NOTES ON TABLE S FOLLOWING LISTING
--------------------------------------------------------------------------------

                      8  RATIO OF LIFETIME OF PI- TO PI+

S 8LR             1.004   0.007           BARDON    66 CNTR  LIFETIME PI-/PI+     7/66
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                      8  CHARGED PION PARTIAL DECAY MODES

S 8P1     CHAR.PION INTO MU (MU-NEU)                          S 4S 2
S 8P2     CHAR.PION INTO E (E-NEU)                            S 3S 1
S 8P3     CHAR.PION INTO MU (MU-NEU) GAMMA                    S 4S 2S 0
S 8P4     CHAR.PION INTO PIO E (E-NEU)                        S 9S 3S 1


S 8P5       CHAR.PION INTO E NEU GAMMA                        S 3S 1S 0
--------------------------------------------------------------------------------

                      8  CHARGED PION BRANCHING RATIOS

S 8R1  *  CHAR.PION INTO MU NEU GAMMA  (UNITS 10**-4)      (P3)/(P1)
S 8R1     26    1.24     0.25             CASTAGNOL 58 EMUL

S 8R2  *  CHAR.PION INTO E NEU         (UNITS 10**-4)      (P2)/(P1)
S 8R2           1.21     0.07             ANDERSON  60 CNTR
S 8R2           1.247    0.028            DI CAPUA  64 CNTR

S 8R3  *  CHAR.PION INTO PIO E NEU     (UNITS 10**-8)      (P4)/(P1)
S 8R3  N  10    2.0      0.6              BACASTOW  62 CNTR
S 8R3  N  52    1.17     0.12             DEPOMMIER 64 CNTR
S 8R3  N  36    0.97     0.20             BARTLETT  64 SPRK
S 8R3  N  38    1.07     0.21             BACASTOW  65 SPRK +
S 8R3  N        1.10     0.26             BERTRAM   65 SPRK                       6/66
S 8R3  N  43    1.1      0.2              DUNAITSEV 65 CNTR                       7/66
S 8R3           1.01     0.08      0.10   DEPOMMIER 66 CNTR                       6/66
S 8R3  N  FOR RECOMMENDED BRANCHING RATIO SEE NOTES ON TABLE S FOLLOWING LISTING

S 8R4  *    CHAR.PION INTO E NEU GAMMA (UNITS 10**-8)      (P5)/(P1)
S 8R4    143    3.0      0.5              DEPOMMIER 63 CNTR                       6/66
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π^0

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                      9  NEUTRAL PION  (135,JPG=0--)  I=1

                      9  PI MASS DIFFERENCE (PI+-)-(PIO)(MEV)

S 9D             5.37     1.0             PANOFSKY  51 CNTR  -
S 9D             4.50     0.31            CHINOWSKY 54 CNTR  -
S 9D             4.62     0.05            HADDOCK   59 CNTR  -
S 9D             4.60     0.04            HILLMAN   59 CNTR
S 9D             4.55     0.07            CASSELS   59 CNTR

S 9D             4.6056   0.0055          CZIRR     63 CNTR
S 9D             4.59     0.03            PETRUKHIN 63 CNTR  -
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                      9  PIO  LIFETIME (UNITS 10**-16)

S 9T   N   76    1.9      0.5      0.5    GLASSER   61 EMUL
S 9T   N   45    2.3      1.1      1.0    TIETGE    62 EMUL
S 9T   N   88    2.8      0.9      0.9    KOLLER    63 EMUL
S 9T             1.05     0.18     0.18   VON DARDE 63 CNTR

S 9T   N   75    1.7      0.5             SHWE      64 EMUL
S 9T             0.730    0.105           BELLETTIN 65 CNTR                       6/66
S 9T   N   67    1.6      0.6      0.5    EVANS     65 EMUL                       6/66
S 9T   N  FOR RECOMMENDED LIFETIME SEE NOTES ON TABLE S FOLLOWING LISTING
--------------------------------------------------------------------------------


                      9  NEUTRAL PION PARTIAL DECAY MODES

S 9P1     PIO INTO 2GAMMA                                     S 0S 0
S 9P2     PIO INTO E+ E- GAMMA                                S 3S 3S 0
S 9P3     PIO INTO 4ELECTRONS                                 S 3S 3S 3S 3
S 9P4       PIO INTO 3 GAMMA                                  S 0S 0S 0
--------------------------------------------------------------------------------

                      9  NEUTRAL PION BRANCHING RATIOS

S 9R1  *  PIO INTO (GAMMA E+ E-)/(2GAMMA)                  (P2)/(P1)
S 9R1           0.0118   0.00048          SAMIOS    61 HBC
S 9R1  *  USING  PANOFSKY RATIO = 1.54
S 9R1     27    0.0117   0.0015           BUDAGOV   60 HBC

S 9R2  *    PIO INTO (3 GAMMA)/(2 GAMMA) (UNITS 10**-6)    (P4)/(P1)
S 9R2  *    0    5.0 OR LESS              DUCLOS    65 CNTR   CL=90 PERCENT       6/6
S 9R3  *    PIO INTO (E+E+E-E-)/(2 GAMMA) (UNITS 10**-5)   (P3)/(P1)
S 9R3    146    3.18     0.30             SAMIOS    62 HBC                        6/6
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REFERENCES FOR TABLES ON STABLE PARTICLES

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES	CODE
ν_e			1 E-NEUTRINO (0,J=1/2)	
LANGER	52	PR 88 689	L M LANGER,R J D MOFFAT //////// INDIANA	S 1
HAMILTON	53	PR 92 1521	D HAMILTON,W F ALFORD,L GROSS // PRINCETON	S 1
FRIEDMAN	58	PR 109 2214	LEWIS FRIEDMAN,LINCOLN G SMITH ///// BNL	S 1
ν_u			2 MU-NEUTRINO (0,J=1/2)	
BARKAS	56	PR 101 778	W H BARKAS,W BIRNBAUM,F M SMITH //// LRL	S 2
DUDZIAK	59	PR 114 336	W F DUDZIAK,R SAGANE,J VEDDER ////// LRL	S 2
FEINBERG	63	ARNS 13 431	G FEINBERG, L M LEDERMAN //////// COLUMBIA	S 2
ALLCOCK	65	PPSL 85 875	G R ALLCOCK ///////////////////// LIVERPOOL	S 2
BARDON	65	PRL 14 449	BARDON,NORTON,PEOPLES +//COLUM+STONY BROOK	S 2
SHAFER	65	PRL 14 923	R E SHAFER,CROWE,JENKINS /////////// LRL	S 2
e			3 ELECTRON (0.5,J=1/2)	
SCHUPP	61	PR 121 1	A A SCHUPP,R W PIDD,H R CRANE // MICHIGAN	S 3
WILKINSO	63	PR 130 852	D T WILKINSON,H R CRANE ////////// MICHIGAN	S 3
COHEN	65	RMP 37 537	E R COHEN, J W M DUMOND //// NAASC+CALTECH	S 3
MOE	65	PR 140 B 952	M K MOE,F REINES //// CASE INST TECHNOLOGY	S 3
RICH	66	PRL 17 271	A RICH, H R CRANE // MICHIGAN	S 3
μ			4 MUON (106,J=1/2)	
FISHER	59	PRL 3 349	FISHER,LEONTIC,LUNDBY,MEUNIER,STROOT//CERN	S 4
ASTBURY	60	ROCH CONF 60 542	ASTBURY,HATTERSLEY,HUSSAIN + // LIVERPOOL	S 4
DEVONS	60	PRL 5 330	DEVONS,GIDAL,LEDERMAN,SHAPIRO // COLUMBIA	S 4
LATHROP	60	NC 17 109	J LATHROP,R A LUNDY,V L TELEGDI + // EFINS	S 4
LATHROP	60	NC 17 114	J LATHROP,R A LUNDY,S PENMAN + //// EFINS	S 4
REITER	60	PRL 5 22	REITER,ROMANOWSKI,SUTTON + ///// CARNEGIE	S 4
TELEGDI	60	ROCH CONF 60 713	V L TELEGDI ///////////////////////// CERN	S 4
CHARPAK	61	PRL 6 128	CHARPAK,FARLEY,GARWIN,MULLER,SENS + //CERN	S 4
HUTCHINS	61	PRL 7 129	D P HUTCHINSON,J MENES + ////// COLUMBIA	S 4
ALIKHANO	62	CERN CONF 423	A I ALIKHANOV,A BABAEV + /// ITEP MOSCOW	S 4
CHARPAK	62	PL 1 16	G CHARPAK,F J M FARLEY,R L GARWIN + //CERN	S 4
FARLEY	62	CERN CONF 415	FARLEY,MASSAM,MULLER,ZICHICHI ///// CERN	S 4
LUNDY	62	PR 125 1686	RICHARD A LUNDY ///////////////////// EFINS	S 4
PARKER	62	NC 23 485	S PARKER,S PENMAN /////////////////// EFINS	S 4
SHAPIRO	62	PR 125 1022	G SHAPIRO,L M LEDERMAN ////////// COLUMBIA	S 4
BABAEV	63	JETP 16 1397	BABAEV,BALATS,KAFTANOV,LANDSBERG + // ITEP	S 4
ECKHAUSE	63	PR 132 422	M ECKHAUSE,T A FILIPPAS + /////// CARNEGIE	S 4
FEINBERG	63	ARNS 13 431	GERALD FEINBERG, L M LEDERMAN /// COLUMBIA	S 4
FRANKEL	63	NC 27 894	S FRANKEL,W FRATI,J HALPERN + ////// PENNA	S 4
FRANKEL	63	PR 130 351	S FRANKEL,W FRATI,J HALPERN + ////// PENNA	S 4
MEYER	63	PR 132 2693	S L MEYER,ANDERSON,BLESER,LEDERMAN+//COLUM	S 4
PARKER	64	PR 133B 768	S PARKER,H L ANDERSON,C REY //////// EFINS	S 4
$\pi^{\pm}$			8 CHARGED PION (140,JPG=0--)I=1	
CROWE	54	PR 96 470	K M CROWE,R H PHILLIPS //////////////// LRL	S 8
BARKAS	56	PR 101 778	W H BARKAS,W BIRNBAUM,F M SMITH ////// LRL	S 8
CROWE	57	NC 5 541	K M CROWE /////////////////// STANFORD HEPL	S 8
CASTAGNO	58	PR 112 1779	C CASTAGNOLI,M MUCHNIK ////////// ROME I F	S 8
ANDERSON	60	PR 119 2050	H L ANDERSON,T FUJII,R H MILLER + // EFINS	S 8
ASHKIN	60	NC 16 490	ASHKIN,FAZZINI,FIDECARO,LIPMAN + //// CERN	S 8
MERRISON	62	ADVP 11 1	A W MERRISON //////////////////// LIVERPOOL	S 8
SHAPIRO	62	PR 125 1022	G SHAPIRO,L M LEDERMAN ////////// COLUMBIA	S 8
CZIRR	63	PR 130 341	JOHN B CZIRR ///////////////////////// LRL	S 8
DEPOMMIE	63	PL 7 285	P DEPOMMIER,HEINTZE,RUBBIA,SOERGEL // CERN	S 8
BARTLETT	64	PR 136B 1432	BARTLETT,DEVONS,MEYER,ROSEN ///// COLUMBIA	S 8
DI CAPUA	64	PR 133B 1333	DI CAPUA,GARLAND,PONDROM,STRELZOFF //COLUM	S 8
BACASTOW	65	PREPRINT(SLAC)		S 8
BERTRAM	65	PR 139 B 617	BERTRAM,MEYER,CARRIGAN+ //// MICH+CARNEGIE	S 8
CLINE	65	PL 15 293	A CLINE,W F FRY //////////////// WISCONSIN	S 8
DUNAITSE	65	JETP 20 58	DUNAITSEV,PETRUKHIN,PROKOSHKIN + /// DUBNA	S 8
ECKHAUSE	65	PL 19 348	ECKHAUSE,HARRIS,SHULER+// WILLIAM AND MARY	S 8
SHAFER	65	UCRL 16365 THESIS	ROBERT E SHAFER ////////////////////// LRL	S 8
REPLACES	65	PRL 14 923	R E SHAFER,K M CROWE,D A JENKINS ///// LRL	S 8
BARDON	66	PRL 16 775	BARDON,DORE,DORFAN,KRIEGER + //// COLUMBIA	S 8
DEPOMMIE	66	PRIV COMM	DEPOMMIER,SOERGEL ///////////////////// CERN	S 8
DUNAITSE	66	JINR P 2534	DUNAITSEV,PIKHTELEV,PROKOSHKIN,SIMO//DUBNA	S 8
KINSEY	66	PR 144 1132	KINSEY,LOBKOWICZ,NORDBERG //ROCHESTER UNIV	S 8
π^{0}			9 NEUTRAL PION (135,JPG=0--)I=1	
PANOFSKY	51	PR 81 565	W K H PANOFSKY,R L AAMODT,J HADLEY /// LRL	S 9
CASSELS	59	PPS 74 92	CASSELS,JONES,MURPHY,O NEILL /// LIVERPOOL	S 9
CHINOWSK	54	PR 93 586	W CHINOWSKY,J STEINBERGER /////// COLUMBIA	S 9
HADDOCK	59	PRL 3 478	HADDOCK,ABASHIAN,CROWE,CZIRR ///////// LRL	S 9
HILLMAN	59	NC 14 887	HILLMAN,MIDDELKOOP,YAMAGATA,ZAVATTINI/CERN	S 9
BUDAGOV	60	JETP 11 755	BUDAGOV,VIKTOR,DZHELEPOV,ERMOLOV + //JINR	S 9
GLASSER	61	PR 123 1014	R G GLASSER,N SEEMAN,B STILLER /////// NRL	S 9
SAMIOS	61	PR 121 275	N P SAMIOS /////////////////// COLUMBIA+BNL	S 9
SAMIOS	62	PR 126 1844	SAMIOS,PLANO,PRODELL + ////// COLUMBIA+BNL	S 9
TIETGE	62	PR 127 1324	J TIETGE,W PUESCHEL ////// MAX PLANCK INST	S 9
CZIRR	63	PR 130 341	JOHN B CZIRR ///////////////////////// LRL	S 9
KOLLER	63	NC 27 1405	E L KOLLER,S TAYLOR,T HUETTER //// STEVENS	S 9
PETRUKHI	63	SIENA CONF 208	V I PETRUKHIN,YU D PROKOSHKIN /////// JINR	S 9
VONDARDE	63	PL 4 51	VON DARDEL,DEKKERS,MERMOD,VAN PUTTEN+/CERN	S 9
SHWE	64	PR 136B 1839	H SHWE,F M SMITH,W H BARKAS ////////// LRL	S 9
BELLETTI	65	NC 40 A 1139	BELLETTINI,BEMPORAD,BRACCINI+/PISA+FIRENZE	S 9
DUCLOS	65	PL 19 253	DUCLOS,FREYTAG,HEINTZE + //CERN+HEIDELBERG	S 9
EVANS	65	PR 139 B 982	D A EVANS ////////////////////////////// OXFORD	S 9

DATA FOR TABLES ON STABLE PARTICLES

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CODE     EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS     DATE
   ABOVE BACKGROUND                                                          PUNCHED

     N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS
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K±

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                10  CHARGED K  (494,JP=0-)  I=1/2

                10  CHARGED K  MASS (MEV)

S10M           493.9     0.2               COHEN     57 RVUE +
S10M           493.7     0.3               BARKAS    63 EMUL  -
S10M           493.78    0.17              GREINER   65 EMUL +   VIA TAU DECAY     7/66
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                10  CHAR.K  LIFETIME (UNITS 10**-8)

S10T              0.95    0.36    0.25  ILOFF     56 EMUL
S10T        52    1.60    0.3     0.3   EISENBERG 58 EMUL
S10T              1.21    0.06    0.06  BURROWES  59 CNTR

S10T        33    1.38    0.24    0.24  FREDEN    60 EMUL
S10T              1.25    0.22    0.17  BARKAS    61 EMUL
S10T        51    1.27    0.36    0.23  BHOWMIK   61 EMUL
S10T       293    1.31    0.08    0.08  NORDIN    61 H BC  -
S10T    *         1.24    0.07          NORDIN 61 RVUE  -
S10T              1.231   0.011   0.011 BOYARSKY  62 CNTR +
S10T              1.2443  0.0038        FITCH     65 CNTR +                        6/66
S10T              1.2266  0.0036        MELISSINO 66 CNTR +                        8/66
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                10  CHARGED K PARTIAL DECAY MODES

S10P1     CHAR. K INTO MU (NEU)              K MU          S 4S 2
S10P2     CHAR. K INTO PI PI0                K PI          S 8S 9


S10P3     CHAR. K INTO PI PI+ PI-            TAU           S 8S 8S 8
S10P4     CHAR. K INTO PI 2PI0               TAU PRIME     S 8S 9S 9
S10P5     CHAR. K INTO MU PI0 NEU            K MU          S 4S 9S 2
S10P6     CHAR. K INTO E PI0 NEU             K E           S 3S 9S 1
S10P7     POSIT.K INTO PI+ PI- E+NEU         K E+          S 8S 8S 3S 1
S10P8     POSIT.K INTO PI+ PI+ E-NEU         K E-          S 8S 8S 3S 1
S10P9      POSIT.K INTO PI+ PI- MU+ NEU      K+MU+ 4       S 8S 8S 4S 2
S10P10     POSIT.K INTO PI+ PI+ MU- NEU      K+MU- 4       S 8S 8S 4S 2
S10P11     CHAR. K INTO E NEU                K E 2         S 3S 1
S10P12     CHAR. K INTO MU NEU GAMMA                       S 4S 2S 0
S10P13     CHAR. K INTO PI PI0 GAMMA                       S 8S 9S 0
S10P14     CHAR. K INTO PI PI+ PI- GAMMA                   S 8S 8S 8S 0
S10P15     CHAR. K INTO PI E+ E-                           S 8S 3S 3
S10P16     CHAR. K INTO PI MU+ MU-                         S 8S 4S 4
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                10  CHARGED K BRANCHING RATIOS

S10R    N  RATIO TO TAU RATE USED WHERE EVER POSSIBLE

S10R1   *  CHAR. K INTO MU NEU (MU2)       (UNITS 10**-2)      (P1)/TOTAL
S10R1   0          58.5      3.0            BIRGE      56 EMUL +
S10R1   0          56.9      2.6            ALEXANDER 57 EMUL +

S10R2   *  CHAR. K INTO PI PI0 (PI2)       (UNITS 10**-2)      (P2)/TOTAL
S10R2   0          27.7      2.7            BIRGE      56 EMUL +
S10R2   0          23.2      2.2            ALEXANDER 57 EMUL +
S10R2              21.0      0.6            CALLAHAN  65 PBC
S10R2   *          21.6      0.6            TRILLING  65 RVUE                      6/66

S10R3   *  CHAR. K INTO PI PI+ PI-(TAU)    (UNITS 10**-2)      (P3)/TOTAL
S10R3   0           5.6      0.4            BIRGE      56 EMUL +
S10R3   0           6.8      0.4            ALEXANDER 57 EMUL +
S10R3   0           5.2      0.3            TAYLOR     59 EMUL +
S10R3   N  OLD DATA EXCLUDED FOLLOWING SUGGESTION OF TRILLING 65                   7/66
S10R3     2332      5.54     0.12           CALLAHAN  64 XBC  +
S10R3               5.71     0.15           DE MARCO  65 HBC                       6/66
S10R3               6.0      0.4            YOUNG      65 EMUL +                   6/66

S10R4   *  CHAR. K INTO PI 2PI0 (TAU PRIME)(UNITS 10**-2)      (P4)/TOTAL
S10R4   0           2.1      0.5            BIRGE      56 EMUL +
S10R4   0           2.2      0.4            ALEXANDER 57 EMUL +
S10R4   0           1.5      0.2            TAYLOR     59 EMUL +
S10R4   N  OLD DATA EXCLUDED FOLLOWING SUGGESTION OF TRILLING 65                   7/66

S10R5   *  CHAR. K INTO MU PI0 NEU (MU3)   (UNITS 10**-2)      (P5)/TOTAL
S10R5   0           2.8      1.0            BIRGE      56 EMUL +
S10R5   0           5.9      1.3            ALEXANDER 57 EMUL +
S10R5   0           2.8      0.4            TAYLOR     59 EMUL +
S10R5   N  OLD DATA EXCLUDED FOLLOWING SUGGESTION OF TRILLING 65                   7/66

S10R6   *  CHAR. K INTO E PI0 NEU (E3)     (UNITS 10**-2)      (P6)/TOTAL
S10R6   0           3.2      1.3            BIRGE      56 EMUL +
S10R6   0           5.1      1.3            ALEXANDER 57 EMUL +
S10R6   N  OLD DATA EXCLUDED FOLLOWING SUGGESTION OF TRILLING 65                   7/66

S10R7   *  POSIT.K INTO PI+ PI- E+ NEU     (UNITS 10**-5)      (P7)/TOTAL


S10R8   *  POSIT.K INTO PI+ PI+ E- NEU     (UNITS 10**-5)      (P8)/TOTAL
S10R8   *           0.2     OR LESS         BIRGE      65 FBC  +  95 PER CT CONF   8/66

S10R9   *   POSIT.K INTO PI+ PI- MU+ NEU (UNITS 10**-5)        (P9)/TOTAL
S10R9        1      0.77     0.54    -0.50  CLINE      65 FBC  +                   8/66

S10R10 *    POSIT.K INTO PI+ PI+ MU- NEU (UNITS 10**-5)        (P10)/TOTAL
S10R10 *     0      3.0 OR LESS             BIRGE      65 FBC  +  95 PER CT CONF   8/66

S10R11 *    CHAR. K INTO E NEU             (UNITS 10**-5)      (P11)/TOTAL
S10R11 *           16.0    OR LESS          BORREANI  64 HBC  +                    8/66
S10R11 *     4      1.9      1.2            BOWEN      66 SPRK +                   8/66

S10R12 *    CHAR. K INTO MU NEU GAMMA      (UNITS 10**-5)      (P12)/TOTAL

S10R13 *    CHAR. K INTO PI PI0 GAMMA      (UNITS 10**-4)      (P13)/TOTAL
S10R13 *    18      2.2      0.7            CLINE      64 FBC  +  PI+ KE 55-90 MEV 8/66

S10R14 *    CHAR. K INTO PI PI+ PI- GAMMA(UNITS 10**-4)        (P14)/TOTAL
S10R14              1.0      0.4            STAMER     65 EMUL +                   8/66

S10R15 *    CHAR. K INTO PI E+ E-          (UNITS 10**-6)      (P15)/TOTAL
S10R15 *     1      1.1     OR LESS         CAMERINI  64 FBC  +                    8/66

S10R16 *    CHAR. K INTO PI MU+ MU-        (UNITS 10**-6)      (P16)/TOTAL
S10R16              3.0     OR LESS         CAMERINI  65 FBC  +  90 PER CT CONF    8/66
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S10R17 *    CHAR. K INTO (PI PI0)/TAU                          (P2)/(P3)
S10R17              3.26     0.23           ROE        61 XBC  +                   8/66
S10R17              4.40     0.23           SHAKLEE    64 XBC  +                   8/66
S10R17     134      3.24     0.34           YOUNG      65 EMUL +                   8/66

S10R18 *    CHAR. K INTO (PI 2PI0)/TAU                         (P4)/(P3)
S10R18              0.30     0.04           ROE        61 XBC  +                   8/66
S10R18              0.35     0.04           SHAKLEE    64 XBC  +                   8/66
S10R18    2027      0.303    0.009          BISI       65 H+HL +                   8/66
S10R18      17      0.393    0.099          YOUNG      65 EMUL +                   8/66

S10R19 *    CHAR. K INTO (MU PI0 NEU)/TAU                      (P5)/(P3)
S10R19              0.84     0.14           ROE        61 XBC  +                   8/66
S10R19              0.59     0.10           SHAKLEE    64 XBC  +                   8/66
S10R19    2175      0.632    0.035          BISI       65 H+HL +                   8/66
S10R19      38      0.90     0.16           YOUNG      65 EMUL +                   8/66
S10R19     636      0.507    0.034          CALLAHAN  66 FBC  +                    8/66

S10R20 *    CHAR. K INTO (E PI0 NEU)/TAU                       (P6)/(P3)
S10R20              0.88     0.11           ROE        61 XBC  +                   8/66
S10R20              0.92     0.08           SHAKLEE    64 XBC  +                   8/66
S10R20     230      0.90     0.06           BORREANI  64 HBC  +                    8/66
S10R20      37      0.90     0.16           YOUNG      65 EMUL +                   8/66
S10R20     873      0.722    0.037          CALLAHAN  66 FBC  +                    8/66

S10R21 *    POSIT.K INTO (PI+ PI- E+ NEU)/TAU(UNITS 10**-4)(P7)/(P3)
S10R21      69      6.7      1.5            BIRGE      65 FBC  +                   8/66

S10R22 *    POSIT.K INTO (PI+ PI- MU+ NEU)/TAU(UNITS 10**-4)(P9)/(P3)
S10R22 *     1      2.5    APPROX           GREINER   64 EMUL +                    8/66


S10R23 *    CHAR. K INTO (E PI0 NEU)/(M2 + P2)(UNITS 10**-2)(P6)/(P1+P2)
S10R23    1679      5.89     0.16           CESTER     66 SPRK +                   8/66

S10R24 *    CHAR. K INTO (PI PI0)/(MU NEU)                     (P2)/(P1)
S10R24              0.3253   0.0062         AUERBACH  66 SPRK +                    8/66

S10R25 *    CHAR. K INTO (E PI0 NEU)/(MU NEU)                  (P6)/(P1)
S10R25              0.0796   0.0054         AUERBACH  66 SPRK +                    8/66

S10R26 *    CHAR. K INTO (MU PI0 NEU)/(MU NEU)                 (P5)/(P1)
S10R26              0.0602   0.0043         AUERBACH  66 SPRK +                    8/66

S10R27 *    CHAR. K INTO (MU NEU)/(TAU)                        (P1)/(P3)
S10R27     427     10.38     0.82           YOUNG      65 EMUL +                   8/66
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K⁰

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                11  NEUTRAL K  (JP=0-)  I=1/2

                11  K0 MASS  (MEV)
S11M             498.1     0.4              CHRISTENS 64 SPRK
S11M             497.44    0.33             KIM        65 HBC                      6/66
S11M      4500   498.9     0.5              BALTAY     66 HBC                      6/66
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                11  K0-K CH. MASS DIFFERENCE (MEV)

S11D              3.9      0.6              ROSENFELD 59 HBC   -
S11D              5.4      1.1              CRAWFORD  59 HBC  +
S11D         9    3.90     0.25             BURNSTEIN 65 HBC   -
S11D        17    4.18     0.18             ENGELMANN 65 HBC                       6/66
S11D              3.71     0.35             KIM        65 HBC                      6/66
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K_1^0

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                12  SHORT-LIVED NEUTRAL K (498, JP=0-)  I=1/2

                12  KO1 LIFETIME (UNITS 10**-10)

S12T        90    1.07     0.13     0.13    BOLDT      58 CC
S12T        62    0.81     0.23     0.15    BROWN      58 PBC
S12T        29    0.84     0.35     0.19    COOPER     58 CC
S12T        39    1.15     0.40     0.25    BLUMENFEL 58 CC
S12T       259    1.06     0.08     0.06    EISLER     58 PBC

S12T       512    0.94     0.05     0.05    CRAWFORD  59 HBC
S12T        63    1.09     0.18     0.15    BOWEN      60 CC
S12T       378    0.94     0.05     0.05    BERTANZA  62 HBC

S12T       503    0.87     0.05             CHRETIEN  63 PBC
S12T       545    0.86     0.04             KREISLER  64 SPRK
S12T       572    0.91     0.04             AUERBACH  65 SPRK                      6/66


S12T      4500    0.92     0.04             BALTAY     66 HBC                      6/66
S12T      5000    0.843    0.013            KIRSCH     66 HBC                      6/66
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                12  KO1 PARTIAL DECAY MODES

S12P1     KO1 INTO PI+ PI-                                     S 8S 8
S12P2     KO1 INTO PI0 PI0                                     S 9S 9
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                12  KO1  BRANCHING RATIOS

S12R1   *  KO1 INTO (PI+ PI-)/TOTAL                            (P1)/TOTAL
S12R1               0.68     0.04           CRAWFORD  59 HBC
S12R1               0.70     0.08           COLUMBIA  60 HBC
S12R1               0.740    0.024          ANDERSON  62 HBC

S12R2   *  KO1 INTO (PI0 PI0)/TOTAL                            (P2)/TOTAL
S12R2               0.27     0.11           CRAWFORD  59 HBC
S12R2               0.26     0.06           BAGLIN     60 PBC
S12R2               0.30     0.035          BROWN      61 XBC
S12R2     1066      0.335    0.014          BROWN      63 XBC
S12R2      198      0.288    0.021          CHRETIEN  63 PBC

S12R3   *   (KO1 INTO PI+ PI- PI0)/(KO2 INTO PI+ PI- PI0)
S12R3   *           0.45    OR LESS         BEHR       66 HLBC    90 PER CT CONF   8/66
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REFERENCES FOR TABLES ON STABLE PARTICLES

$K^{\pm}$

10 CHARGED K (494,JP=0-)I=1/2

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES	CODE
BIRGE	56	NC 4 834	BIRGE,PERKINS,PETERSON,STORK,WHITEHEA//LRL	S10
ILOFF	56	PR 102 927	ILOFF,GOLDHABER,LANNUTTI,GILBERT + /// LRL	S10
ALEXANDE	57	NC 6 478	ALEXANDER,JOHNSTON,OCEALLAIGH//DUBLIN INST	S10
COHEN	57	FUND.CONS.PHYS.	E R COHEN,K M CROWE,J DUMOND // AI+LRL+CIT	S10
EISENBER	58	NC 8 663	EISENBERG,KOCH,LOHRMANN,NIKOLIC + /// BERN	S10
BURROWES	59	PRL 2 117	BURROWES,CALDWELL,FRISCH,HILL + ////// MIT	S10
TAYLOR	59	PR 114 359	S TAYLOR,HARRIS,CREAR,LEE,BAUMEL//COLUMBIA	S10
FREDEN	60	PR 118 564	S C FREDEN,F C GILBERT,R S WHITE ///// LRL	S10
BARKAS	61	PR 124 1209	BARKAS,DYER,MASON,NORRIS,NICKOLS,SMIT//LRL	S10
BHOWMIK	61	NC 20 857	B BHOWMIK,P C JAIN,P C MATHUR //DELHI UNIV	S10
NORDIN	61	PR 123 2166	PAUL NORDIN JR ///////////////////////// LRL	S10
ROE	61	PRL 7 346	ROE,SINCLAIR,BROWN,GLASER + ///// MICH+LRL	S10
BOYARSKI	62	PR 128 2398	BOYARSKI,LOH,NIEMELA,RITSON ////////// MIT	S10
BARKAS	63	PRL 11 26	W H BARKAS,J N DYER,H H HECKMAN ////// LRL	S10
BIRGE	63	PRL 11 35	BIRGE,ELY,GIDAL,CAMERINI + // LRL+WIS+BARI	S10
BORREANI	64	PL 12 123	G BORREANI,G RINAUDO,A WEREBROUCK /// TURIN	S10
CALLAHAN	64	PR 136 B 1463	A CALLAHAN,R MARCH,R STARK ///// WISCONSIN	S10
CAMERINI	64	PRL 13 318	CAMERINI,CLINE,FRY,POWELL // WISCONSIN+LRL	S10
CLINE	64	PRL 13 101	D CLINE, W F FRY ////////////// WISCONSIN	S10
GREINER	64	PRL 13 284	D GREINER, W OSBORNE, W BARKAS /////// LRL	S10
SHAKLEE	64	PR 136 B 1423	SHAKLEE,JENSEN,ROE,SINCLAIR ///// MICHIGAN	S10
BIRGE	65	PR 139 B 1600	BIRGE,ELY,GIDAL,CAMERINI,CLINE + //LRL+WIS	S10
BISI	65	NC 35 768	BISI,BORREANI,CESTER,FERRARO + ///// TURIN	S10
BISI	65	PR 139 B 1068	BISI,MARZARI-CHIESA,RINAUDO // TURINO,INFN	S10
CALLAHAN	65	PRL 15 129	A CALLAHAN,D CLINE ///////////// WISCONSIN	S10
CAMERINI	65	NC 37 1795	CAMERINI,CLINE,GIDAL,KALMUS,KERNAN/WIS+LRL	S10
CLINE	65	PL 15 293	A CLINE,W F FRY /////////////// WISCONSIN	S10
DE MARCO	65	PR 140 B 1430	DE MARCO,GROSSO,RINAUDO ////// TURINO+CERN	S10
FITCH	65	PR 140 B 1088	FITCH,QUARLES,WILKINS //PRINCETON+MT HOLYK	S10
STAMER	65	PR 138 B 440	STAMER,HUETTER,KOLLER,TAYLOR,GRAUMAN//STEV	S10
TRILLING	65	UCRL 16473	GEORGE H TRILLING ////////////////////// LRL	S10
(THIS IS AN UPDATED VERSION OF REPORT AT 1965 ARGONNE CONF, PAGE 115)				S10
YOUNG	65	UCRL 16362	POH-SHIEN YOUNG (THESIS,BERKELEY) //// LRL	S10
AUERBACH	66	BERKELEY CONF	AUERBACH + //	S10
BOWEN	66	BERKELEY CONF	BOWEN + //	S10
CALLAHAN	66	UCRL 16593	CALLAHAN,CAMERINI,HANTMAN,MARCH + //// LRL	S10
CESTER	66	PL 21 343	CESTER,ESCHSTRUTH,ONEILL+ //PRINCETON-PENN	S10
GREINER	65	ARNS 15 67	QUOTED BY BARKAS // LRL	S10
MELISSIN	66	BERKELEY CONF	MELISSINOS + //	S10
QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS				
BLOCK	62	CERN CONF 371	BLOCK,LENDINARA,MONARI /////// NWU+BOLOGNA	S10

K^0

11 NEUTRAL K (JP=0-)I=1/2

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES	CODE
CRAWFORD	59	PRL 2 112	CRAWFORD,CRESTI,GOOD,STEVENSON,TICHO //LRL	S11
ROSENFEL	59	PRL 2 110	A H ROSENFELD,F SOLMITZ,R D TRIPP //// LRL	S11
CHRISTEN	64	PRL 13 138	CHRISTENSON,CRONIN,FITCH,TURLAY//PRINCETON	S11
BURNSTEI	65	PR 138 B 895	R A BURNSTEIN,H A RUBIN ///////// MARYLAND	S11
ENGELMAN	65	PRI COMM	INGLEMAN,FILTHUTH ////////////// HEIDELBERG	S11
KIM	65	PR 140 B 1334	J K KIM,L KIRSCH,D MILLER /////// COLUMBIA	S11
BALTAY	66	PR 142 932	BALTAY,SANDWEISS,STONEHILL + //YALE+BNL	S11

K_1^0

12 SHORT-LIVED NEUTRAL K (498, JP=0-) I=1/2

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES	CODE
BLUMENFE	58	CERN CONF 272	H BLUMENFELD,W CHINOWSKY,L LEDERMAN//COLUM	S12
BOLDT	58	PRL 1 150	E BOLDT,D C CALDWELL,Y PAL /////////// MIT	S12
BROWN	58	CERN CONF 272	J BROWN,D GLASER + ////////////// MICHIGAN	S12
COOPER	58	CERN CONF 272	W A COOPER,H FILTHUTH + ///// JUNGFRAUJOCH	S12
EISLER	58	CERN CONF 272	F EISLER,R PLANO + // BNL+COL+BOLOGNA+PISA	S12
CRAWFORD	59	PRL 2 266	CRAWFORD,CRESTI,DOUGLASS,GOOD,TICHO +//LRL	S12
BAGLIN	60	NC 18 1043	BAGLIN,BLOCH,BRISSON,HENNESSY + //PARIS EP	S12
BIRGE	60	ROCH CONF 601	R W BIRGE,P P ELY + //////// LRL+WISCONSIN	S12
BOWEN	60	PR 119 2030	BOWEN,HARDY,REYNOLDS,SUN,MOORE+/ PRINCE+BNL	S12
COLUMBIA	60	ROCH CONF 727	M SCHWARTZ + ///////////////////// COLUMBIA	S12
MULLER	60	PRL 4 418	MULLER,BIRGE,FOWLER,GOOD,PICCIOMI+/LRL+BNL	S12
BROWN	61	NC 19 1155	BROWN,BRYANT,BURNSTEIN,GLASER,KADYK+//MICH	S12
FITCH	61	NC 22 1160	V FITCH,P PIRCUE,R PERKINS /// PRINCE+LASL	S12
GOOD	61	PR 124 1223	GOOD,MATSEN,MULLER,PICCIONI + //////// LRL	S12
ANDERSON	62	CERN CONF 836	J A ANDERSON,F S CRAWFORD + ////////// LRL	S12
BERTANZA	62	PREPRINT D105	BERTANZA,CONNOLLY,CULWICK,EISLER + /// BNL	S12
(BERTANZA UNPUBLISHED,BUT RECERTIFIED BY AUTHORS,AUGUST 66)				S12
CRAWFORD	62	CERN CONF 827	F S CRAWFORD ////////////////////////// LRL	S12
BROWN	63	PR 130 769	BROWN,KADYK,TRILLING,ROE + ///LRL+MICHIGAN	S12
CHRETIEN	63	PR 131 2208	CHRETIEN+ //// BRANDEIS+BROWN+HARVARD+ MIT	S12
KREISLER	64	PR 136 B 1074	M KREISLER,O OVERSETH,J CRONIN / PRINCETON	S12
AUERBACH	65	PRL 14 192	AUERBACH,LANDE,MANN,SCIULLI,UTO + /// PENN	S12
FRANZINI	65	PR 140 B 127	FRANZINI,KIRSCH,PLANO + / COLUMBIA+RUTGERS	S12
TRILLING	65	UCRL 16473	GEORGE H TRILLING ////////////////////// LRL	S12
(THIS IS AN UPDATED VERSION OF REPORT AT 1965 ARGONNE CONF, PAGE 115)				S12
BALTAY	66	PR 142 932	BALTAY,SANDWEISS,STONEHILL + /// YALE+BNL	S12
KIRSCH	66	NEVIS 146	L KIRSCH,P SCHMIDT ////////////// COLUMBIA	S12

DATA FOR TABLES ON STABLE PARTICLES

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CODE     EVENTS QUANTITY  ERROR+  ERROR-   REFERENCE YR TECH SIGN COMMENTS      DATE
     ABOVE BACKGROUND                                                         PUNCHED

       N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

 K02                    13   LONG-LIVED NEUTRAL K (498, JP=0-)  I=1/2

                        13  KO2-KO1  MASS DIFFERENCE (UNITS OF INVERSE KO1 LIFE)

S13D   *         1.9       0.3              FITCH      61 CNTR
S13D             0.84      0.29      0.21 GOOD       61 PBC
S13D   *         1.5       0.2              CAMERINI   62 PBC
S13D             0.5       0.1              CHRISTENS  63 SPRK

S13D             0.78      0.20             AUBERT1    64 PBC
S13D             0.82      0.12             FUJII      64 SPRK
S13D             0.47      0.21             ALBERT     65 PBC                          6/66
S13D             0.26      0.36      0.26 BALDO-CEO  65 PBC      ASS.CP CONS.
S13D   *         0.60  OR LESS              FITCH      65 SPRK     CF. MEISNER 66      7/66
S13D   N         0.82      0.14             VISHNEVSK  65 SPRK                         6/66
S13D             0.44      0.036            ALFF       66 SPRK                         6/66
S13D             0.55      0.1              CHRISTENS  66 SPRK                         6/66
S13D             0.48      0.022            BOTT       66 SPRK                         6/66
S13D       59    0.65      0.30             MEISNER 1  66 HBC                          6/66
S13D          + 0.44       0.05             PICCIONI   66 SPRK     PRELIMINARY         8/66
S13D   N  EXPERIMENTS UNSENSITIVE TO SMALL D OR WITH NON-GAUSSIAN ERRORS OMITTED

S13D   N  SIGN OF MASS DIFFERENCE, KO2 MINUS KO1
S13D   N      +  45 TO 1 (F) OR 5 TO 1(Y)MEISNER 2 66 HBC      BETTING ODDS        8/66
S13D   N      +  0.44      0.05             PICCIONI   66 SPRK     EST. STAN. DEV.     8/66

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                        13  KO2 LIFETIME (NANOSEC)

S13T   *   ASSUMED DS=DQ AND DELTA I=1/2 CRAWFORD   59 HBC
S13T      34   81.0      32.0      24.0   BARDON     58 CC
S13T      15   51.0      24.0      13.0   DARMON     62 FBC
S13T           54.0       6.0             FUJII      64 SPRK
S13T    1700   61.       15.0      12.0   ASTBURY    65 CC                            8/66
                        13  KO2 PARTIAL DECAY MODES

S13P1      KO2 INTO 3PIO                                           S 9S 9S 9
S13P2      KO2 INTO PI+ PI- PIO                                    S 8S 8S 9
S13P3      KO2 INTO PI MU NEUTRINO                                 S 8S 4S 2
S13P4      KO2 INTO PI E NEUTRINO                                  S 8S 3S 1
S13P5      KO2 INTO PI+ PI-                                        S 8S 8
S13P6      KO2 INTO MU+ MU-                                        S 4S 4
S13P7        KO2 INTO E+ E-                                        S 3S 3
S13P8        KO2 INTO E MU                                         S 3S 4
S13P9        KO2 INTO TWO GAMMAS                                   S 0S 0
S13P10       KO2 INTO PI+ PI- GAMMA                                S 8S 8S 0
S13P11       KO2 INTO PIO PIO                                      S 9S 9

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                        13  KO2 DECAY RATES

S13W1  *  KO2 INTO PIO PIO PIO          (UNITS 10**6 SEC-1)  (P1)
S13W1     22     5.1      1.2              BRISSON   64 FBC
S13W1     54     5.22    1.03       0.84   BEHR      66 HLBC     ASSUMES CP          8/66

S13W2  *  KO2 INTO PI+ PI- PO           (UNITS 10**6 SEC-1)  (P2)
S13W2     18     3.26      0.77            ANDERSON  65 HBC                          8/66
S13W2     14     1.4       0.4             FRANZINI  65 HBC                          6/66
S13W2    136     2.62    0.28       0.27   BEHR      66 HLBC     ASSUMES CP          8/66

S13W3  *  KO2 INTO PI E NEUTRINO        (UNITS 10**6 SEC-1)  (P4)
S13W3            8.1       1.0             AUBERT    65 HLBC                         8/66

S13W4  *  KO2 INTO CHARGED (3-BODY)   (UNITS 10**6 SEC-1)  (P2+P3+P4)
S13W4    107   14.7        1.8             AUERBACH  65 SPRK USING NEW K1 LIFE       6/66

S13W5  *  KO2 INTO LEPTONIC (KMU3+KE3) (UNITS 10**6 SEC-1) (P3+P4)
S13W5    109    9.4        1.3             FRANZINI  65 HBC                          6/66

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                        13  KO2 BRANCHING RATIOS

S13R1  *  KO2 INTO (PIO PIO PIO)/CHARGED                       (P1)/(P2+P3+P4)
S13R1    110     0.25      0.08            ALEKSANYA 64 FBC                          6/66
S13R1     24     0.24      0.08            ANIKINA   64 CC                           6/66
S13R1     29     0.31      0.07      0.06  MESTVIRI2 65 CC                           6/66

S13R2  *  KO2 INTO (PI+ PI- PIO)/CHARGED                       (P2)/(P2+P3+P4)


S13R2     59     0.165  0.038              ASTIER    61 CC                           8/66
S13R2     75     0.157  0.03       0.04    LUERS     64 HBC                          8/66
S13R2     79     0.151     0.020           ADAIR     64 HBC                          8/66
S13R2     66     0.15   0.03               ASTBURY1  65 CC                           8/66
S13R2    326     0.159     0.015           ASTBURY 2 65 CC                           6/66
S13R2    566     0.178     0.017           GUIDONI   65 HBC                          6/66
S13R2   1729     0.144     0.004           HOPKINS   65 HBC                          6/66
S13R2    126     0.162     0.015           HAWKINS   66 HBC                          6/66

S13R3  *  KO2 INTO (PI MU NEUTRINO)/CHARGED                    (P3)/(P2+P3+P4)
S13R3    479     0.356     0.07            LUERS     64 HBC
S13R3            0.39      0.08      0.10  ASTBURY 1 65 CC                           7/66

S13R4  *  KO2 INTO (PI E NEUTRINO)/CHARGED                     (P4)/(P2+P3+P4)
S13R4    479     0.487     0.05            LUERS     64 HBC
S13R4            0.46      0.08      0.10  ASTBURY 1 65 CC                           7/66
S13R4     59     0.51      0.07            MESTVIRIS 65 CC                           6/66

S13R5  *  KO2 INTO (PI E NEU)/((PI E NEU)+(PI MU NEU))        (P4)/(P3+P4)
S13R5    320     0.415     0.120           ASTIER    61 CC

S13R6  *  KO2 INTO(PI+ PI- PIO)/TOTAL                          (P2)/TOTAL
S13R6     16     0.18      0.05            STERN     64 HBC

S13R7  *  KO2 INTO(LEPTON PI NEUTRINO)/TOTAL                   (P3+P4)/TOTAL
S13R7     14     0.58      0.17            ALEXANDER 62 HBC

S13R8  *    KO2 INTO (2 GAMMA)/TOTAL     (UN. 10**-4)          (P9)/TOTAL
S13R8            1.3       0.6             CRIEGEE   66 SPRK                         8/66

S13R9  *  KO2 INTO (PI+ PI-)/CHARGED    (UNIT 10**-3)          (P5)/(P2+P3+P4)
S13R9  *    0    10.0   OR LESS            NEAGU     61 CC
S13R9  *    0    15.0   OR LESS            LUERS     64 HBC
S13R9  *   11     2.5   OR LESS            ABASHIAN  64 SPRK
S13R9      45     2.0       0.4            CHRISTENS 64 SPRK
S13R9      54     2.08      0.35           GALBRAITH 65 SPRK
S13R9             1.97      0.18           CRONIN    65 SPRK                         6/66
S13R9             2.22      0.27           DEKKERS   66 CNTR                         6/66
S13R9             2.052     0.082          DE BOUARD 66 CNTR                         6/66

S13R10 *  KO2 INTO (PI MU NEU)/(PI E NEU)                      (P3)/(P4)
S13R10            0.81      0.19           ADAIR     64 HBC                          6/66
S13R10            0.78      0.15           DE BOUARD 65 CNTR

S13R11 *  KO2 INTO (MU+MU-)/CHARGED   (UNITS 10**-4)           (P6)/(P2+P3+P4)
S13R11 *          1.0 OR LESS              ANIKINA   65 CC                           6/66
S13R11 *          1.0 OR LESS              CARPENTER 65 SPRK                         6/66
S13R11 *          2.      OR LESS          DE BOUARD 65 SPRK                         8/66
S13R11 *          0.5     OR LESS          ABASHIAN  66 SPRK    90 PER CT CONF       8/66

S13R12 *    KO2 INTO (PI+ PI- GAMMA)/TOTAL (UN. 10**-3)        (P10)/TOTAL
S13R12 *        15.0 OR LESS               ANIKINA   65 CC                           6/66
S13R12 *         3.0 OR LESS               NEFKENS   66 SPRK                         6/66

S13R13 *    KO2 INTO (E+ E-)/CHARGED    (UN. 10**-4)           (P7)/(P2+P3+P4)
S13R13 *        10.0 OR LESS               ANIKINA   65 CC                           6/66
S13R13 *         1.0 OR LESS               CARPENTER 65 SPRK                         6/66
S13R13 *         1.      OR LESS           DE BOUARD 65 SPRK                         8/66
S13R13 *         0.5     OR LESS           ABASHIAN  66 SPRK    90 PER CT CONF       8/66

S13R14 *    KO2 INTO (E MU)/CHARGED     (UN. 10**-4)           (P8)/(P2+P3+P4)
S13R14 *        10.0 OR LESS               ANIKINA   65 CC                           6/66
S13R14 *         1.0 OR LESS               CARPENTER 65 SPRK                         6/66
S13R14 *         0.5     OR LESS           ABASHIAN  66 SPRK    90 PER CT CONF       8/66

S13R15 *   KO2 INTO(E+ PI- NEU)/(E- PI+ NEU)
S13R15 *         1.                        LUERS     64 HBC                          8/66
S13R15*    97    0.90      0.18            NEAGU     61 CC                           8/66
S13R15 * 2500    1.06   0.05               ABASHIAN  66 SPRK                         8/66
S13R15 *         1.01   0.16               LUERS     64 HBC                          8/66

S13R16 *   KO2 INTO(MU+ PI- NEU)/(MU- PI+ NEU)
S13R16 * 3200    1.00   0.04               ABASHIAN  66 SPRK                         8/66

S13R17 *      KO2 INTO (PIO PIO)/TOTAL  (UNITS 10**-3)         (P11)/TOTAL
S13R17      7    1.2       1.5       1.2   CRIEGEE   66 SPRK                         7/66

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 η                       14  ETA (549,JPG=0-+)  I=0

                         14  ETA MASS  (MEV)

S14M        53  549.0      1.2             BASTIEN   62 HBC
S14M        35  546.0      4.0             PICKUP    62 HBC
S14M        91  548.0      1.0             ALFF      62 HBC
S14M            549.3      2.9             DELCOURT  63 CNTR
S14M       148  549.0      0.7             FOELSCHE  64 HBC
S14M       325  552.0      3.0             KRAEMER   64 DBC
S14M            548.2      0.65            FOSTER3   65 HBC                          7/66
S14M       250  552.0      4.0             JAMES     66 HBC                          6/66

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                         14  ETA  WIDTH (MEV)

S14W    *   91     10 OR LESS              ALFF      62 HBC
S14W    *  325   16.0    OR LESS           KRAMER    64 DBC
S14W    *  148     10 OR LESS              FOELSCHE  64 HBC
S14W    *   31   12 OR LESS                JAMES     66 HBC                          6/66
S14W    *  PI+PI-PIO WIDTH LESS THAN 4.0   BALTAY    66 DBC                          7/66

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                         14  ETA PARTIAL DECAY MODES

S14P1      ETA INTO 2GAMMA                                    S 0S 0
S14P2      ETA INTO 3PIO                                      S 9S 9S 9
S14P3      ETA INTO PI+ PI- PIO                               S 8S 8S 9
S14P4      ETA INTO PI+ PI- GAMMA                             S 8S 8S 0
S14P5      ETA INTO   E+E-PIO                                 S 9S 3S 3
S14P6      ETA INTO E+E-PI+PI-                                S 8S 8S 3S 3
S14P7      ETA INTO PIO 2GAMMA                                S 9S 0S 0
S14P8      ETA INTO E+E-GAMMA                                 S 3S 3S 0
S14P9      ETA INTO 2PIO GAMMA                                S 9S 9S 0
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DATA FOR TABLES ON STABLE PARTICLES

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CODE     EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS     DATE
  ABOVE BACKGROUND                                                           PUNCHED

        N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

                      14 ETA   BRANCHING RATIOS

            (P9) IS ASSUMED = 0 IN ALL RATIOS

S14R1   *    ETA INTO NEUTRALS/CHARGED                        (P1+P2+P7)/(P3+P4)
S14R1      10     2.5      1.0          PICKUP    62 HBC
S14R1      53     3.20     1.26         BASTIEN   62 HBC
S14R1      91     2.5      0.5          ALFF      62 HBC
S14R1             2.7      0.8          SHAFER    62 HBC
S14R1             2.6       .9          BUSCHBECK 63 HBC                          7/66
S14R1             2.89     0.56         ALFF-STEI 66 HBC                          6/66
S14R1     280     4.5      1.0          JAMES     66 HBC                          6/66

S14R2   *  ETA INTO 2GAMMA/CHARGED                            (P1)/(P3+P4)
S14R2             0.99     0.48         CRAWFORD  63 HBC

S14R3   *    ETA INTO PI0 2GAMMA/NEUTRALS                     (P7)/(P1+P2+P7)
S14R3             0.375    0.036        DI GIUGNO 66 CNTR                         6/66
S14R3              .19      .08         GRUNHAUS  66 SPRK                         7/66

S14R4   *  ETA INTO (PI+ PI- GAMMA)/(PI+ PI- PI0)             (P4)/(P3)
S14R4             0.14     0.08         FOELSCHE  64 HBC
S14R4      24     0.73     0.25         PAULI     64 DBC
S14R4             0.30     0.06         CRAWFORD1 66 HBC                          6/66
S14R4   N   9     0.27     0.10         PAULI     64 DBC   CF NOTE N BELOW        6/66
S14R4   N THE PAULI VALUE BASED ON ONLY 9 EVENTS IS DUE TO CRAWFORD1 66
S14R4              .10      .10         KRAEMER   64 DBC                          7/66
S14R4              .196     .041        FOSTER3   65 HBC                          7/66

S14R5   *  ETA INTO 3PI0/(PI+ PI- PI0)                        (P2)/(P3)
           FOR THIS RATIO, SEE NOTES ON TABLE S FOLLOWING THIS LISTING
S14R5             0.83     0.32         CRAWFORD  63 HBC    ASSUM.P7/P2 = 0       7/66
S14R5             2.0      1.0          FOELSCHE  64 HBC    ASSUM.P7/P2 = 0       7/66
S14R5             0.90     0.24         FOSTER1   65 HBC    ASSUM.P7/P2 = 0       7/66
S14R5   N         0.38     0.15         CRAWFORD2 66 HBC  ASSUM.(P7)/(P2)=1.8     6/66
S14R5   N         0.41     0.11         FOSTER1   65      ASSUM.(P7)/(P2)=1.8     6/66
        N      GIVEN BY CRAWFORD2 66

S14R6   *  ETA INTO 2GAMMA/3PI0                               (P1)/(P2)
S14R6   *         1.1      0.3 OR LESS  CHRETIEN  62 PBC
S14R6             1.10     0.5          MULLER    63 DBC    ASSUM.P7/P2 = 0       7/66
        N      FOR PRECEDING CARD, SEE NOTES ON TABLE S FOLLOWING THIS LISTING.

S14R7   *  ETA INTO 2GAMMA/(PI+ PI- P0)                       (P1)/(P3)
S14R7             1.61     0.39         FOSTER    64 HBC

S14R8   *    ETA INTO NEUTRAL/(PI+ PI- PI0)                   (P1+P2+P7)/(P3)
S14R8     280     3.6      0.6          KRAEMER   64 DBC
S14R8             3.8      1.1          PAULI     64 DBC                          7/66

S14R9   *  ETA INTO  (E+E-PI0)/(PI+PI-PI0)  (UNITS 10**-2) (P5)/(P3)
S14R9   *  LESS THAN    1.1        1.1  PRICE     65 HBC
S14R9   *    0    0.77  OR LESS         FOSTER2   65 HBC
S14R9   *          .9   OR LESS         BAGLIN    66 HLBC                         7/66


S14R10 *    ETA INTO (E+E-PI+PI-)/TOTAL  (UNITS 10**-2)    (P6)/TOTAL
S14R10 *          0.7 OR LESS           RITTENBER 65 HBC                          6/66

S14R11 *    ETA INTO (E+E-PI+PI-)/(PI+PI-GAMMA)            (P6)/(P4)
S14R11       1    0.026    0.026        GROSSMAN  66 HBC                          6/66

S14R12 *    ETA INTO 2 GAMMA/NEUTRALS                      (P1)/(P1+P2+P7)
S14R12            0.416    0.022        DI GIUGNO 66 CNTR                         6/66
S14R12             .47      .06         GRUNHAUS  66 SPRK                         7/66

S14R13 *    ETA INTO 3PI0/NEUTRALS                         (P2)/(P1+P2+P7)
S14R13            0.209    0.027        DI GIUGNO 66 CNTR                         6/66
S14R13             .34      .04         GRUNHAUS  66 SPRK                         7/66

S14R14 *      ETA INTO PI0 2GAMMA/2GAMMA                   (P7)/(P1)              7/66
S14R14 *           .5   OR LESS         WAHLIG    66 SPRK                         7/66

S14R15 *      ETA INTO (E+E-PI0)/TOTAL                     (P5)/TOTAL             7/66
S14R15 *          0.7 OR LESS           RITTENBER 65 HBC                          6/66

S14R16 *    ETA INTO 2GAMMA/(3PI0 + PI0 2GAMMA)            (P1)/(P2+P7)
S14R16            0.80      .25         BACCI     63 CNTR                         7/66
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AUTHOR   YR JOURNAL VOL. PAGE AUTHORS                          // LABORATORIES    CODE
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K_2^0

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                         13   LONG-LIVED NEUTRAL K (498, JP=0-)  I=1/2

BARDON    58 ANP 5 156          M BARDON,K LANDE,L LEDERMAN //COLUMBIA+BNL      S13
CRAWFORD  59 PRL 2 361          CRAWFORD,CRESTI,DOUGLASS,GOOD + ////// LRL      S13
ASTIER    61 AIX CONF 1 227     ASTIER,BLASKOVIC,RIVET,SIAUD +/// PARIS+EP      S13
FITCH     61 NC  22 1160        V FITCH,P PIRCUE,R PERKINS ///// PRINCETON      S13
GOOD      61 PR 124 1223        GOOD,MATSEN,MULLER,PICCIONI,POWELL +// LRL      S13

ALEXANDE 62 PRL 9 69            G ALEXANDER,S ALMEIDA,F CRAWFORD ///// LRL      S13
ANIKINA   62 CERN CONF 452      M H ANIKINA M S ZHURAVIEVA + //// GAS+JINR      S13
CAMERINI 62 PR 128 362          CAMERINI,FRY,GAIDOS,BIRGE,ELY +///WISC+LRL      S13
CARMON    62 PL 3 57            J CARMON,A ROUSSET,J SIX /////////PARIS+EP      S13
JOVANCVI 63 BNL CONF 42         JOVANOVIC,FISCHER,BURRIS + // BNL+MARYLAND      S13

ABASHIAN 64 PRL 13 243          ABASHIAN,ABRAMS,CARPENTER,FISHER+/ILLINOIS      S13
ADAIR     64 PL 12 67           R K ADAIR,L E LEIPUNER ////////// YALE+BNL      S13
ALEKSANY 64 JETP 19 1019        ALEKSANYAN+/// LEBEDEV+MOS ENG PHYS+EREVAN      S13
ANIKINA   64 JETP 19 42         ANIKINA,ZHURAVLEVA+//GEORG ACAD SCI+ DUBNA      S13
CHRISTEN 64 PRL 13 138          CHRISTENSON,CRONIN,FITCH,TURLAY //PRINCETN      S13
FUJII     64 PRL 13 253         FUJII,JOVANOVICH,TURKOT,ZORN //BNL+MARYLND      S13
LUERS     64 PR 133 B 1276      LUERS,MITTRA,WILLIS,YAMAMOTO ///////// BNL      S13
STERN     64 PRL 12 459         STERN,BINFORD,LIND,ANDERSON + /// WISC+LRL      S13

ANIKINA   65 JINR P 2488        ANIKINA,VARDENGA,ZHURAVLEVA,KOTLYA+//DUBNA      S13
ANDERSON 65 PRL 14 475          ANDERSON,CRAWFORD,GOLDEN,STERN +//LRL+WISC      S13
AUBERT    65 PL 17 59           AUBERT,BEHR,CANAVAN,CHOUNET+///PARIS+ORSAY      S13
ASTBURY1 65 PL 16 80            ASTBURY,FINOCCHIARO,BEUSCH + / CERN+ZURICH      S13
ASTBURY   65 PL 18 175          ASTBURY,MICHELINI,BEUSCH + /// CERN+ZURICH      S13
AUERBACH 65 PRL 14 192          AUERBACH,LANDE,MANN,SCIULLI + ////// PENNA      S13
BALDO-CE 65 NC 38 684           BALDO-CEOLIN,CALIMANI,CIAMPOLILLO + /PADVA      S13
BEHR      65 ARGONNE CONF 59    BEHR,BRISSON,BELLOTTI+ // EP+MILANO+PADOVA      S13
CARPENTE 65 ARGONNE CONF 91     CARPENTER,ABASHIAN,ABRAMS + ///// ILLINOIS      S13
CHRISTEN 65 PR 140 B 74         CHRISTENSON,CRONIN,FITCH,TURLAY//PRINCETON      S13
CRONIN    65   ARGONNE CONF 17 FITCH,ROTH,RUSS,VERNON-TO BE PUB/PRINCETON      S13
FITCH     65 PRL 15 73          FITCH,ROTH,RUSS,VERNON ///////// PRINCETON      S13
FRANZINI 65 PR 140 B 127        FRANZINI,KIRSCH,PLANO + / COLUMBIA+RUTGERS      S13
GALBRAIT 65 PRL 14 383          GALBRAITH,MANNING,JONES +//AERE+BRIST+RHEL      S13
GUIDONI   65 ARGONNE CONF 49    +BARNES,FOELSCHE,FERBEL,FIRESTO+//BNL+YALE      S13
HOPKINS   65 ARGONNE CONF 67    H W K HOPKINS,BACON,EISLER // VAND+RUTGERS      S13
MESTVIRI 65 JINR P 2449         MESTVIRISHVILI,NYAGU,PETROV,RUSAKOV+//JINR      S13
MESTVIRI 65 JINR P 2450         MESTVIRISHVILI,NYAGU,PETROV,RUSAKOV+//JINR      S13
PRICE     65 PRL 15 123         L R PRICE,F S CRAWFORD /////////////// LRL      S13
TRILLING 65 UCRL 16473          GEORGE H TRILLING ///////////////////// LRL      S13
  (THIS IS AN UPDATED VERSION OF REPORT AT 1965 ARGONNE CONF, PAGE 115)        S13

ALFF      66 PL 20 207+PRIV CM ALFF-STEINBERGER,HEUER,KLEINKNECHT+ //CERN      S13
BOTT      66   PRIV COMM        BOTT,BODENHAUSEN ////////////////////  CERN      S13
CHRISTEN 66   PRIVATE COMMUNICATION QUOTED BY MEISNER 66                        S13
                WHICH CORRECTS RESULTS OF                                       S13
CRIEGEE   66 PRL 17 150         +FOX,FRAUENFELDER,HANSON,MOSCAT+//ILLINOIS      S13
DEBOUARD 66   PRIV COMM         DEBOUARD ///////////////////////////// CERN      S13
DEKKERS   66 THESIS BRUSSELS    D DEKKERS + ////////////////////////// CERN      S13
HAWKINS   66 PL 21 238          C J B HAWKINS //////////////////////// YALE      S13
MEISNER1 66 PRL 16 278          G W MEISNER,B B CRAWFORD,F CRAWFORD // LRL      S13
MEISNER2 66 UCRL 16938          G MEISNER,B CRAWFORD,F CRAWFORD ////// LRL      S13
NEFKENS   66 PL 19 706          NEFKENS,ABASHIAN,ABRAMS,CARPENTER+ /// ILL      S13
PICCIONI 66   PRIV. COMMUN.     O PICCIONI,BURNETT,GOOD,SWANSON + /// UCSD      S13

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                                14 ETA(549,JPG=0-+)I=0

PEVSNER   61 PRL 7 421          PEVSNER,KRAEMER,NUSSBAUM,RICHARDSON +//JHU      S14
ALFF      62 PRL 9 322          ALFF,BERLEY,COLLEY,BRUGGER +///COL+RUTGERS      S14
BASTIEN   62 PRL 8 114          BASTIEN,BERGE,DAHL,FERRO-LUZZI + ///// LRL      S14
CHRETIEN 62 PRL 9 127           CHRETIEN+ //BRAND+BROWN+HARVARD+MIT+PADOVA      S14
PICKUP    62 PRL 8 329          E PICKUP,ROBINSON,SALANT ///// NRC+CAN+BNL      S14
SHAFER    62 CERN CONF 307      J SHAFER,FERRO-LUZZI,MURRAY + ///// UC+LRL      S14

BACCI     63 PRL 11 37          BACCI,PENSO,SALVINI + //ROME U+CNEN FRASCA      S14
BUSCHBEC 63 SIENA CONF 1 166    BUSCHBECK-CZAPP,COOPER + //VIENNA+CERN+AMS      S14
CRAWFORD 63 PRL 10 546          F S CRAWFORD,LLOYD,FOWLER /////// LRL+DUKE      S14
DELCOURT 63 PL 7 215            DELCOURT,LEFRANCOIS,PEREZ Y JORBA+// ORSAY      S14
MULLER    63 SIENA CONF 99      MULLER,PAULI + //LPCHE+SACLAY IF+ROME+INFN      S14

FOELSCHE 64 PR 134 B 1138       H W FOELSCHE,H L KRAYBILL ////////// YALE      S14
KRAEMER   64 PR 136 B 496       KRAEMER,MADANSKY,FIELDS + // JHU+NW U+WOOD      S14
PAULI     64 PL 13 351          E PAULI,A MULLER ///////////// LPCHE+SACLAY      S14

PRICE     65 PRL  15  123       L.R.PRICE,F.S.CRAWFORD                //LRL      S14
FOSTER1   65 PR 138 B 652       FOSTER,PETERS,MEER,LOEFFLER +//WISC+PURDUE      S14
FOSTER2   65 ATHENS             FOSTER,GOOD,MEER                //WISCONSIN      S14
FOSTER3   65 THESIS             M.C.FOSTER                      //WISCONSIN      S14
RITTENBE 65 PRL 15 556          RITTENBERG,KALBFLEISCH /////////// LRL+BNL      S14

ALFF-STE 66 PR 145 1072         ALFF-STEINBERGER,BERLEY+//COLUMBIA+RUTGERS      S14
BAGLIN    66 CNR-1-1966         BAGLIN,BEZAGUET,DEGRANGE+  //ECOLE POLY+UC      S14
BALTAY    66 PRL 16 1224        +FRANZINI,KIM,KIRSCH+/COLUMBIA+STONY BROOK      S14
CRAWFRD1 66 PRL  16  333        F.S.CRAWFORD,L.R.PRICE                //LRL      S14
CRAWFRD2 66 PRL 16 907          F S CRAWFORD,L LLOYD,E FOWLER   //LRL+DUKE      S14
DIGIUGNO 66 PRL 16 767          DIGIUGNO,GIORGI,SILVESTRI+//NAP+TRST+FRASC      S14
JAMES     66 PR 142   896       F E JAMES,H L KRAYBILL ////////// YALE+BNL      S14
GROSSMAN 66 UCRL 16684          R GROSSMAN,L PRICE,F CRAWFORD //////// LRL      S14
GRUNHAUS 66 THESIS              J.GRUNHAUS                       //COLUMBIA      S14
WAHLIG    66 PRL  17  221       WAHLIG,SHIBATA,MANNELLI          //MIT+PISA      S14

                              QUANTUM NUMBERS NOT REFERRED TO IN DATA CARDS

BASTIEN   62 PRL 8 114          BASTIEN,BERGE,DAHL,FERRO-LUZZI,MILLER+/LRL      S14
CARMONY   62 PRL 8 117          D CARMONY,A ROSENFELD,VAN DE WALLE /// LRL      S14
ROSENFEL 62 PRL 8 293           A ROSENFELD,D CARMONY,VAN DE WALLE /// LRL      S14

                  REFERENCES ON ETA ASYMMETRY PARAMETERS

BALTAY    66 PRL  16  1224      BALTAY,FRANZINI,KIM,KIRSCH+/COLUM+STONY BK      S14
BEHR      66  PREPRINT          BEHR,BRISSON,BELLOTTI,AUBERT //PA+MI+PA+OR      S14
CRAWFRD1 66 PRL  16  333        F.S.CRAWFORD,L.R.PRICE                //LRL      S14
COLUMBIA 66 UCRL-16693          COLUMBIA,LRL,PURDUE,WISCONSIN,YALE               S14
FOWLER    66 BAPS 11  380       E.C.FOWLER                            //DUKE      S14

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DATA FOR TABLES ON STABLE PARTICLES

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CODE     EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS     DATE
    ABOVE BACKGROUND                                                       PUNCHED

     N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS
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                        16  PROTON  (938,J=1/2)  I=1/2

                        16  PROTON  MASS (MEV)

S16M          938.256    0.005          COHEN      65 RVUE                       7/66
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                        16  PROTON LIFETIME  (UNITS 10**26 YR)

S16T    *  OVER                    1.5     BACKENSTO 60 CNTR
S16T    *  OVER                    1.0     GIAMATI   62 CNTR
S16T    *  OVER                   60.0     KROPP     65 CNTR                     6/66
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                        16 PROTON MAGNET. MOMENT(E/2MP)

S16MM         2.792763 0.000030          COHEN      65 RVUE                       7/66
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                        17  NEUTRON (939,J=1/2)  I=1/2

                        17  NEUTRON-PROTON MASS DIF.(MEV)

S170            1.2939   0.0004         BONDELID  60 CNTR
S170            1.2933   0.0001         SALGO     64 CNTR
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                        17  NEUTRON LIFETIME (UNITS 10**3 SEC)

S17T            1.01      0.03      0.03  SOSNOVSKI 59 PILE
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                        17  NEUTRON MAGNETIC MOMENT (MAGNETONS,938.2 MEV)

S17MM       -1.913148 0.000066          COHEN      56 SPECIAL                    7/66
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                        18  LAMBDA (1115,JP=1/2+)  I=0

                        18  LAMBDA  MASS (MEV)

S18M         25 1115.06     0.41            ARMENTERO 62 HBC     SEE NOTE L  BELOW
S18M            1115.27     0.36            BALTAY    62 HBC     SEE NOTE L  BELOW
S18M        317 1115.42     0.13            BHOWMIK   63 RVUE    SEE NOTE L  BELOW
        L  ABOVE LAMBDA MASSES HAVE BEEN RAISED 20 KEV TO ACCOUNT FOR 43 KEV
        L     INCREASE IN PROTON MASS AND 23 KEV DECREASE IN PION MASS
S18M    *       1115.4      0.2             BADIER    64 HBC     ERROR IS STATIS.   6/66
S18M    *   635 1115.86     0.09            BALTAY    65 HBC     ERROR IS STATIS.   6/66
S18M            1115.61     0.07            SCHMIDT   65 HBC                        6/66
S18M            1115.6      0.4             LONDON    66 HBC                        6/66
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                        18  LAMBDA LIFETIME (UNITS 10**-10)

S18T    0  188     2.63      0.21      0.21  BOLDT     58 CC
S18T    0   74     2.75      0.45      0.38  BLUMENFEL 58 CC
S18T    0   61     2.08      0.46      0.31  BROWN     58 PBC
S18T    0   40     3.04      0.78      0.51  COOPER    58 CC
S18T    0  454     2.29      0.15      0.13  EISLER    58 HBC
S18T    0  825     2.72      0.16      0.16  CRAWFORD  59 HBC
S18T    0  140     2.72      0.29      0.27  BOWEN     60 CC
S18T    0   OLD MEASUREMENTS NOT INCLUDED IN AVERAGE

S18T    U  748     2.58      0.11      0.11  BERTANZA  62 HBC
S18T               2.60      0.28      0.20  C-C CHANG 62 HBC
S18T    U 3447     2.52      0.08            FUNG      62 PBC                        6/66
S18T       799     2.69      0.11      0.11  HUMPHREY  62 HBC

S18T      2239     2.36      0.06      0.06  BLOCK     63 HEBC
S18T       706     2.76      0.20            CHRETIEN  63 PBC
S18T       794     2.59      0.09            HUBBARD   64 HBC
S18T      2260     2.31      0.10            KREISLER  64 SPRK
S18T      1378     2.59      0.07            SCHWARTZ  64 HBC

S18T       635     2.51      0.16            BALTAY    65 HBC                        6/66
S18T               2.6       0.1             HILL      65 SPRK
S18T       916     2.35      0.09            BURAN     66 HLBC                       6/66

S18T    U  UNPUBLISHED MEASUREMENTS (EXCEPT THESES) NOT INCLUDED IN AVERAGE          7/66

S18T    N  CONTRADICTORY DATA.  SEE NOTES ON TABLE S FOLLOWING LISTING.
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                        18  LAMBDA MAGNETIC MOMENT (MAGNETONS,938.26 MEV)

S18MM              -1.5       0.5            COOL      62 SPRK
S18MM               0.0       0.6            KERNAN    63 CC
S18MM      8553    -1.37      0.72           ANDERSON  64 HBC
S18MM       151    -0.5       0.28           CHARRIERE 65 EMUL
S18MM      2534    -0.77      0.27           HILL      65 SPRK
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                        18  LAMBDA PARTIAL DECAY MODES

S18P1     LAMBDA INTO PROTON PI-                               S16S 8
S18P2     LAMBDA INTO NEUTRON PI0                              S17S 9
S18P3     LAMBDA INTO PROTON MU- NEUTRINO                      S16S 4S 2
S18P4     LAMBDA INTO PROTON E- NEUTRINO                       S16S 3S 1
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                        18  LAMBDA BRANCHING RATIOS

S18R1  *  LAMBDA INTO (P PI-)/((P PI-)+(N PI0))                   (P1)/(P1+P2)
S18R1          0.627    0.031          CRAWFORD  59 HBC
S18R1          0.65     0.05           COLUMBIA  60 HBC
S18R1     903  0.643    0.016          HUMPHREY  62 HBC
S18R1          0.685    0.017          ANDERSON  62 HBC

S18R2  *  LAMBDA INTO (N PI0)/((P PI-)+(N PI0))                   (P2)/(P1+P2)
S18R2          0.23     0.09           EISLER    57 PBC
S18R2          0.43     0.14           CRAWFORD  59 HBC
S18R2          0.28     0.08           BAGLIN    60 PBC
S18R2          0.35     0.05           BROWN     63 XBC
S18R2      75  0.291    0.034          CHRETIEN  63 PBC

S18R3  *  LAMBDA INTO (P E- NEU)/TOTAL    (UNITS  10**-3)    (P4)/(P1+P2)
S18R3      15  2.0      0.5            HUMPHREY  61 RVUE
S18R3       8  2.9      1.5       1.2  ALBERT    62 FBC
S18R3     150  0.82     0.12      0.13 ELY       63 FBC
S18R3      20  1.55     0.34           LIND      64 HBC
S18R3     102  0.78     0.12           BAGLIN    64 FBC

S18R4  *  LAMBDA INTO (P MU- NEU)/TOTAL   (UNITS  10**-4)    (P3)/(P1+P2)
S18R4  *    1  0.2   OR GREATER        GOOD      62 HBC
S18R4  *    1  1.0   OR LESS           ALSTON    63 HBC
S18R4  *    2  1.0   OR LESS           KERNAN    64 FBC
S18R4  *   BETWEEN 1.3 AND 6.0         LIND      64 HBC
S18R4       3  1.3      0.7            LIND      64 RVUE                          7/66
S18R4       2  1.5      1.2            RONNE     64 FBC
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                        18  LAMBDA DECAY PARAMETERS

S18A-  *  ALPHA LAMBDA- (LAMBDA INTO PI- PROTON)
S18A-          0.762    0.083          MERRILL   66 HBC                           8/66
S18A-          0.62     0.05           CRONIN    63 CNTR                          6/66
S18A-  *       0.682    0.104          BERGE     66 HBC                           8/66

S18A0  *  ALPHA0 /ALPHA- FOR LAMBDA (L INTO PI0 N/L INTO PI- P)

S18A0  *       1.10     0.27           CORK      60 CNTR

S18AE        ALPHA LAMBDA E- (LAMBDA INTO PROTON E- NEUTRINO)
S18AE          0.06     0.19           BARLOW    65 SPRK                          7/66

S18B-  *    BETA LAMBDA- (LAMBDA INTO PI- PROTON)
S18B-          0.18     0.24           CRONIN    63 CNTR                          6/66

S18C-  *    GAMMA LAMBDA- (LAMBDA INTO PI- PROTON)
S18C-          0.78     0.15           CRONIN    63 CNTR                          6/66
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                        19  SIGMA+   (1189,JP=1/2+)  I=1

                        19  SIGMA+ MASS (MEV)

S19M         1189.38     0.15           BARKAS    63 EMUL     SEE NOTE S BELOW
S19M      58 1189.43     0.22           BHOWMIK   64 EMUL     SEE NOTE S BELOW
       S  ABOVE SIGMA MASSES HAVE BEEN REDUCED 23 KEV BECAUSE OF LOWER PION MASS
S19M         1189.5      0.5            BURNSTEIN 64 HBC
S19M         1189.64     0.11           SCHMIDT   65 HBC                           6/66
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                        19  SIGMA+ LIFETIME (UNITS 10**-10)

S19T    *                               GLASER     58 RVUE
S19T      127    0.98      0.16    0.12  PUSCHEL   60 EMUL
S19T       41    0.82      0.34    0.20  EVANS     60 EMUL
S19T      117    0.85      0.14    0.11  FREDEN    60 EMUL
S19T       54    0.80      0.10    0.067 KAPLON    60 EMUL

S19T       23    0.76      0.22    0.14  CHIESA    61 EMUL
S19T       49    0.75      0.13    0.09  BERTHELOT 61 PBC
S19T      140    0.82      0.10    0.08  BARKAS    61 EMUL
S19T      192    0.749     0.056   0.052 GRARD     62 HBC
S19T      456    0.765     0.04    0.04  HUMPHREY  62 HBC
S19T      203    0.84      0.12    0.08  BHOWMIK   64 EMUL
S19T      181    0.84      0.09          BALTAY    65 HBC                          6/66
S19T      900    0.76      0.03          CARAYANNO 65 HBC                          6/66
S19T             0.83      0.018         CHANG     65 HBC                          6/66
S19T      381    0.80      0.07          COOK      66 SPRK                         7/66
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                        19  SIGMA+ MAGNETIC MOMENT (MAGNETONS,938.26 MEV)

S19MM      44    2.7       1.2           SULLIVAN  66 EMUL  + PHOTOPRODUCTION  8/66
S19MM  *   24    4.3       1.5           MCINTURFF 64 EMUL
S19MM     381    1.5       1.1           COOK      66 SPRK                         7/66
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                        19  SIGMA+ PARTIAL DECAY MODES

S19P1     SIGMA + INTO PROTON PI0                              S16S 9
S19P2     SIGMA + INTO NEUTRON PI+                             S17S 8
S19P3     SIGMA + INTO NEUTRON PI+ GAMMA                       S17S 8S 0
S19P4     SIGMA + INTO LAMBDA E+ NEU                           S18S 3S 0
S19P5     SIGMA + INTO PROTON GAMMA                            S16S 0
S19P6     SIGMA + INTO NEUTRON MU+ NEUTRINO                    S17S 4S 2
S19P7     SIGMA + INTO NEUTRON E+ NEUTRINO                     S17S 3S 1
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CODE     EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS     DATE
    ABOVE BACKGROUND                                                        PUNCHED

      N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

                          19  SIGMA+  BRANCHING RATIOS

S19R1  *  SIGMA+  INTO (NEUTRON PI+)/(NUCLEON PI)              (P2)/(P1+P2)
S19R1     308    0.490    0.024           HUMPHREY  62 HBC
S19R1            0.46     0.02            CHANG     65 HBC                        6/66

S19R2  *  SIGMA+ INTO (NEUT PI+ GAM)/(PI+N) (UNITS 10**-4) (P3)/(P2)
S19R2  *  ABOUT                   0.4     COURANT   63 HBC
S19R2  *   26   17.6      3.5             BAZIN 2   65 HBC    OUR ESTIMATE        6/66

S19R3  *  SIGMA+ INTO(LAMBDA E+ NEU)/(PI+N) (UNITS 10**-4) (P4)/(P2)
S19R3  *     0.3    APPROX.               COURANT   64 HBC

S19R4  *  SIGMA+  INTO (N MU+/NEU)/(PI+N)   (UNITS 10**-4) (P6)/(P2)
S19R4  *    1 EVENT SEEN.NO RATIO GIVEN. GALTIERI 62 EMUL
S19R4  *    0  LESS THAN              2.3 BURNSTEIN 63 HBC

S19R5  *  SIGMA+  INTO (N E+ NEU)/(N PI+)  (UNITS 10**-4)  (P7)/(P2)
S19R5  *    0  LESS THAN              2.6 BURNSTEIN 63 HBC
S19R5  *       LESS THAN          4.0     MURPHY    64 PBC
S19R5  *    1  LESS THAN             1.03 NAUENBERG 64 HBC

S19R6  *  SIGMA+  INTO (P GAMMA)/(P PIO)  (UNITS 10**-3)    (P5)/(P1)
S19R6  *    1    0.68  OR LESS            CARRARA   64 HBC
S19R6      24    0.37     0.08            BAZIN     65 HBC
S19R6       4    0.17                     QUARENI   65 EMUL                       6/66

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                          19 SIGMA+ DECAY PARAMETERS

S19A+  *  ALPHA SIGMA+   (SIGMA +  INTO PI+ NEUTRON)

S19A+           -0.03     0.08            CORK      60 CNTR
S19A+           -0.20     0.24            TRIPP     62 HBC
S19A+           +0.014    0.052           BANGERTER 66 HBC    K-P TO SIG+ PI-     7/66

S19A0  *  ALPHA SIGMA0 (SIG+ INTO PIO PROTON)
S19A0           -0.80     0.16            BEALL     62 CNTR
S19A0           -0.986    0.072           BANGERTER 66 HBC    K-P TO SIG+ PI-     7/66

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REFERENCES FOR TABLES ON STABLE PARTICLES

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AUTHOR   YR JOURNAL VOL. PAGE AUTHORS                            // LABORATORIES    CODE
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                                 16 PROTON (938,J=1/2) I=1/2

BACKENST 60 NC    16  749        BACKENSTOSS,FRAUENFELDER,HYAMS + //// CERN      S16
COHEN    65 RMP 37 537           E R COHEN, J W M DUMOND //// NAASC+CALTECH      S16
KROPP    65 PR 137 B 740         W R KROPP,F REINES ///CASE INST TECHNOLOGY      S16

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                                 17 NEUTRON (939,J=1/2) I=1/2

COHEN    56 PR 104 283           V W COHEN, CORNGOLD, RAMSEY // BNL+HARVARD      S17
SOSNOVSK 59 JETP  9  717         SOSNOVSKII,SPIVAK,PROKOFEV + // IAE MOSCOW      S17
BONDELID 60 PR   120  887        BONDELID,BUTLER,KENNEDY +//USNRL+CATH UNIV      S17
SALGO    64 NP    53  457        R SALGO, STAUB, WINKLER, ZAMBONI // ZURICH      S17
COHEN    65 RMP 37 537           E R COHEN,DUMOND ///// NAASC+CAL INST TECH      S17

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                                 18 LAMBDA (1115,JP=1/2+) I=0

EISLER   57 NC     5 1700        EISLER,PLANO,SAMIOS,SCHWARTZ + //COLUM+BNL      S18
BLUMENFE 58 CERN CONF 270        H BLUMENFELD,W CHINOWSKY,L LEDERMAN//COLUM      S18
BOLDT    58 PRL    1  148        E BOLDT,D O CALDWELL,Y PAL /////////// MIT      S18
BROWN    58 CERN CONF 270        BROWN,GLASER,GRAVES,PERL,CRONIN + //  MICH      S18
COOPER   58 CERN CONF 270        W A COOPER,H FILTHUTH + ///// JUNGFRAUJOCH      S18
EISLER   58 CERN CONF 270        F EISLER,PLANO,BASSI + // BNL+COLUM+BOL+PI      S18
CRAWFORD 59 PRL    2  266        CRAWFORD,CRESTI,DOUGLASS,GOOD + /////  LRL      S18

BAGLIN   60 NC    18 1043        BAGLIN,BLOCH,BRISSON,HENNESSY + //PARIS-EP      S18
BOWEN    60 PR   119 2030        BOWEN,HARDY,REYNOLDS,SUN + ///// PRINCETON      S18
CORK     60 PR   120 1000        CORK,KERTH,WENZEL,CRONIN,COOL //LRL+PR+BNL      S18
COLUMBIA 60 ROCH CONF 726        M SCHWARTZ + ///////////////////// COLUMBIA      S18
HUMPHREY 61 PRL    6  478        HUMPHREY,KIRZ,ROSENFELD,RHEE + //LRL+SYRAC      S18

ANDERSON 62 CERN CONF 832        ANDERSON,CRAWFORD,GOLDEN,LLOYD + ///// LRL      S18
ARMENTER 62 CERN CONF 236        ARMENTEROS+/CERN+EP+LONDON+BIRM+CEN-SACLAY      S18
AUBERT   62 NC    25  479        AUBERT,BRISSON,HENNESSY,SIX + /// PARIS-EP      S18
BALTAY   62 CERN CONF 233        BALTAY,FOWLER,SANDWEISS,CULWICK+//YALE+BNL      S18
BERTANZA 62 PREPRINT D105        BERTANZA,CONNOLLY,CULWICK,EISLER + /// BNL      S18
CHANG    62 THESIS DUKE          CHUEN CHUEN CHANG ////////////////// DUKE      S18
COOL     62 PR   127 2223        COOL,HILL,MARSHALL + ///// BNL+MIT+NYU+ANL      S18
FUNG     62 BAPS   7  619        SUN YIU FUNG ///////////////////////// LRL      S18
GOOD     62 PRL    9  518        M L GOOD,V G LIND ///////////// WISCONSIN      S18
HUMPHREY 62 PR   127 1305        W E HUMPHREY,R R ROSS //////////////// LRL      S18

ALSTON   63 UCRL 10926           ALSTON,KIRZ,NEUFELD,SOLMITZ,WOHLMUT // LRL      S18
BERGE    63 THESIS (BERKELEY)    J PETER BERGE ///////////////////////// LRL      S18
BHOWMIK  63 NC    28 1494        B BHOWMIK,D P GOYAL //////////////// DELHI      S18
BLOCK    63 PR   130  766        BLOCK,GESSAROLI,RATTI,KIKUCHI + //NW+BLGNA      S18
BROWN    63 PR   130  769        BROWN,KADYK,TRILLING,ROE + ///LRL+MICHIGAN      S18
CHRETIEN 63 PR   131  2208       CHRETIEN,CROUCH+///BRAND+BROWN+HARVARD+MIT      S18
CRONIN   63 PR   129 1795        J W CRONIN,O E OVERSETH /////// PRINCETON      S18
ELY      63 PR   131  868        ELY,GIDAL,KALMUS,OSWALD,POWELL + ///// LRL      S18
KERNAN   63 PR   129  870        KERNAN,NOVEY,WARSHAW,WATTENBERG // ANL+ILL      S18

ANDERSON 64 PRL   13  167        J A ANDERSON,F S CRAWFORD ///////////// LRL      S18
BADIER   64 DUBNA CONF 1 593     BADIER,BARLOUTAUD + //////EP+SACLAY+AMSTDM      S18
BAGLIN   64 NC    35  577        BAGLIN,BRISSON,ROUSSET,SIX+ /PARIS+EP+CERN      S18
HUBBARD  64 PR   135 B 183       HUBBARD,BERGE,KALBFLEISCH,SHAFER + /// LRL      S18
KERNAN   64 PR   133 B 1271      KERNAN,POWELL,SANDLER + //LRL+UN-COLL-LOND      S18
KREISLER 64 PR 136 B 1074        M N KREISLER,O OVERSETH,J CRONIN ///PRINCE      S18
LIND     64 PR   135 B 1483      LIND,BINFORD,GOOD,STERN //////// WISCONSIN      S18
RONNE    64 PL    11   357       RONNE+ /// CERN+EP+UCOL-LONDON+UNIV.BERGEN      S18
SCHWARTZ 64 UCRL 11360 THESIS    JOSEPH ADAM SCHWARTZ ////////////////// LRL      S18

BALTAY   65 PR 140 B 1027        BALTAY,SANDWEISS,CULWICK,KOPP + //YALE+BNL      S18
BARLOW   65 PL   18  64          J BARLOW,BLAIR,DUKE,MANN+//CERN+RUTH+PENNA      S18
CHARRIER 65 PL    15    66       CHARRIERE,GIBSON+ //// EPUL+BRIST+CERN+MPI      S18
HILL     65 PRL   15    85       D A HILL,K K LI /////////////////////// MIT      S18
SCHMIDT  65 PR 140 B 1328        P SCHMIDT ///////////////////////// COLUMBIA      S18

BURAN    66 PL 20 318            BURAN,EIVINDSON,SKJEGGESTAD,TOFTE + //OSLO      S18
LONDON   66 PR 143 1034          LONDON,RAU,GOLDBERG,LICHTMAN+//BNL+SYRACUS      S18
MERRILL  66 BERKELEY CONF        MERRILL,SHAFER,BERGE                 //LRL      S18
     CF. 66 UCRL 16455           DEANE MERRILL (THESIS, BERKELEY) ///// LRL      S18

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                             19  SIGMA + (1189,JP=1/2+)  I=1

GLASER   58 CERN CONF 270        GLASER,GOOD,MORRISON //////////// MICH+LRL      S19
EVANS    60 NC 15 873            BRIST+BRUSS+IAS-U.COL-DUBLIN+LON+MILAN+PAD      S19
FREDEN   60 NC 16 611            S FREDEN,H KORNBLUM,R WHITE ////////// LRL      S19
KAPLON   60 ANP 9 139            M KAPLON,A MELISSINOS,YAMANOUCHI // ROCHES      S19
CORK     60 PR 120 1000          CORK,KERTH,WENZEL,CRONIN,COOL /LRL+PRI+BNL      S19
PUSCHELL 60 NP 20 254            W PUSCHEL //////////////// MAX PLANCK INST      S19

BARKAS   61 PR 124 1209          BARKAS,DYER,MASON,NICHOLS,SMITH ////// LRL      S19
BERTHELO 61 NC 21 693            BERTHELOT,DAUDIN,GOUSSU + /// SACLAY+ORSAY      S19
CHIESA   61 NC 19 1171           CHIESA,QUASSIATI,RINAUDO ////// INFN-TURIN      S19

BEALL    62 PRL 8 75             BEALL,CORK,KEEFE,MURPHY,WENZEL /////// LRL      S19
GRARD    62 PR 127 607           F GRARD,G A SMITH ///////////////////// LRL      S19
GALTIERI 62 PRL 9 26             GALTIERI,BARKAS,HECKMAN,PATRICK,SMITH//LRL      S19
HUMPHREY 62 PR 127 1305          W E HUMPHREY,R R ROSS //////////////// LRL      S19
TRIPP    62 PRL 9 66             R D TRIPP,M B WATSON,M FERRO-LUZZI /// LRL      S19

BARKAS   63 PRL 11 26            W H BARKAS,J N DYER,H H HECKMANN ///// LRL      S19
    ALSO 61 UCRL 9450            JOHN DYER (THESIS, BERKELEY)  ///////  LRL      S19
COURANT  63 SIENA CONF  1 15     COURANT,FILTHUTH,BURNSTEIN+ // CERN+MD+NRL      S19

BHOWMIK  64 NP 53 22             B BHOWMIK,P JAIN,P MATHUR,LAKSHMI // DELHI      S19
BURNSTEI 64 PRL 13 66            BURNSTEIN,DAY,KEHOE,SECHI ZORN,SNOW /MARYL      S19
CARRARA  64 PL 12 72             CARRARA,CRESTI,GRIGOLETTO,PERUZZO+//PADOVA      S19
COURANT  64 PR 136 B 1791        COURANT,FILTHUTH+//CERN+HEIDLB+MD+NRL +BNL      S19
MCINTURF 64 PRL 13 246           A D MCINTURFF,C E ROOS ///////// VANDERBILT      S19
MURPHY   64 PR 134 B 188         C THORNTON MURPHY /////////////// WISCONSIN      S19
NAUENBER 64 PRL 12 679           NAUENBERG,MARATECK,BLUMENFELD+ /COL+RUT+PR      S19
    ALSO 65 PR 137 B 1105        ALFF,GELAND,BRUGGER,BERLEY+ /COLUM+RUT+BNL      S19

BALTAY   65 PR 140 B 1027        BALTAY,SANDWEISS,CULWICK,KOPP + //YALE+BNL      S19
BAZIN    65 PRL 14 154           BAZIN,BLUMENFELD,NAUENBERG +//PRINCE+COLUM      S19
BAZIN    65 PR 140 B 1358        BAZIN,PLANO,SCHMIDT +   //PRINC+RUTG+COLUM      S19
CARAYAN  65 PR 138 B 433         CARAYANNOPOULOS,TAUTFEST,WILLMANN// PURDUE      S19
CHANG    65 NEVIS 145  THESIS    CHUNG YUN CHANG ////////////////// COLUMBIA      S19
QUARENI  65 NC 40 A 928          QUARENI,CARTACCI + //////BOL+FIR+GEN+PARMA      S19
SCHMIDT  65 PR 140 B 1328        P SCHMIDT ///////////////////////// COLUMBIA      S19
BANGERTE 66 PRL TO BE PUBLIS.    BANGERTER,GALTIERI,BERGE,MURRAY+   // LRL      S19
SULLIVAN 66 BAPS 11 767          SULLIVAN,KOTELCHUCK,MCINTURFF,ROOS//VANDER      S19

COOK     66 PRL  17  223         V COOK,EWART,MASEK,ORR,PLATNER//WASHINGTON      S19

          QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS

TRIPP    62 PRL 8 175            R TRIPP,M WATSON,M FERRO-LUZZI /////// LRL      S19
ALFF     63 SIENA CONF 1 205     ALFF,NAUENBERG,KIRSCH,BERLEY+/COLU+RUT+BNL      S19
COURANT  63 SIENA CONF 1 73      COURANT,FILTHUTH,BURNSTEIN,DAY+//CERN+MARY      S19

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DATA FOR TABLES ON STABLE PARTICLES

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CODE    EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS    DATE
   ABOVE BACKGROUND                                                        PUNCHED

     N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS
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                              20  SIGMA-  (1198,JP=1/2+)  I=1

                              20  SIGMA-   MASS (MEV)

S20M          1197.6       0.5              BARKAS    63 EMUL
S20M      566 1197.0       0.2              BURNSTEIN 64 HBC
S20M          1197.43      0.11             SCHMIDT   65 HBC                   6/66
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                              20 SIGMA- MASS DIFFER.(-)-(+)(MEV)

S20D      2500    8.25     0.25             DOSCH     65 HBC
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                              20  SIGMA- LIFETIME (UNITS 10**-10)

S20T   *         1.67      0.40     0.28    BROWN     58 PBC
S20T   *         1.89      0.33     0.25    EISLER    58 PBC
S20T   *         1.45      0.12     0.12    CRAWFORD  59 HBC
S20T   *   45    1.35      0.32     0.17    CHIESA    61 EMUL
S20T   *   41    1.75      0.39     0.30    BARKAS    61 EMUL

S20T     1208    1.58      0.06     0.06    HUMPHREY  62 HBC
S20T             1.666     0.026            CHANG     65 HBC                   6/66
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                              20  SIGMA- PARTIAL DECAY MODES

S20P1     SIGMA - INTO  NEUTRON PI-                              S17S 8
S20P2     SIGMA - INTO  NEUTRON PI- GAMMA                        S17S 8S 0
S20P3     SIGMA - INTO  NEUTRON MU- NEUTRINO                     S17S 4S 2
S20P4     SIGMA - INTO  NEUTRON E- NEUTRINO                      S17S 3S 1
S20P5     SIGMA - INTO  LAMBDA E- NEUTRINO                       S18S 3S 1
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                              20  SIGMA-  BRANCHING RATIOS

S20R1  *  SIGMA - INTO (N MU- NEU)/(N PI-) (UNITS 10**-3)  (P3)/(P1)
S20R1      22    0.66      0.15             COURANT   64 HBC
S20R1      11    0.56      0.20             BAZIN     65 HBC                   6/66

S20R2  *  SIGMA - INTO (N E- NEU)/(N PI-)  (UNITS 10**-3)  (P4)/(P1)
S20R2       9    1.0       0.4     0.3      MURPHY    64 PBC
S20R2      16    1.37      0.34             NAUENBERG 64 HBC
S20R2      16    1.15      0.4              MILLER    64 FBC
S20R2      31    1.4       0.3              COURANT   64 HBC


S20R3  *  SIGMA - INTO (LAMBDA E- NEU)/(N PI-) (UNITS 10**-4)(P5)/(P1)
S20R3      11    0.75      0.28             COURANT   64 HBC

S20R4  *  SIGMA - INTO (N PI- GAMMA)/(N PI-) (UNITS 10**-4)(P2)/(P1)
S20R4  *  ABCUT                    0.1      COURANT   63 HBC
S20R4  *   28   11.2       2.1              BAZIN     65 HBC    CUR ESTIMATE    6/66
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                              20 SIGMA- DECAY PARAMETERS

S20A-  *  ALPHA SIGMA-
S20A-           -0.16      0.21             TRIPP     62 HBC
S20A-           -0.010     0.043            BANGERTER 66 HBC    K-P TO SIG+ PI-   7/66
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                              21  SIGMA 0  (1193,JP=1/2+)  I=1

                              21  (SIGMA-) - (SIGMA0) MASS DIFFERENCE (MEV)

S21D1      16    4.75      0.1              BURNSTEIN 64 HBC
S21D1      37    4.87      0.12             DOSCH     65 HBC
S21D1            4.99      0.12             SCHMIDT   65 HBC                   6/66
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                              21  SIGMA0 LIFETIME (UNITS 10**-14)

S21T   *     1.0 OR LESS                    DAVIS     62 EMUL
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                       21  SIGMA 0 PARTIAL DECAY MODES

S21P1       SIGMA 0 INTO LAMBDA GAMMA                            S18S 0
S21P2       SIGMA 0 INTO LAMBDA E+ E-                            S18S 3S 3
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                              22  XI-  (1321,JP=1/2 ) I=1/2

                              22  XI-  MASS (MEV)

S22M   H   11 1317.0      2.2               WANG      61 PBC
S22M   H   18 1317.9      1.9               FOWLER    61 PBC
S22M   H (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22M   *    1 1322.0      1.3               BROWN     62 HBC    ANTI-XI-        7/66

S22M       62 1321.1      0.65              SCHNEIDER 63 HBC
S22M      517 1321.4      0.4               JANEAU    63 FBC
S22M      241 1321.1      0.3               BADIER    64 HBC
S22M   *  ALL MASSES ABOVE MUST BE RAISED 0.09 MEV BECAUSE LAMBDA MASS RAISED
S22M      299 1320.9      0.5               LONDON    66 HBC                   6/66


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                              22  XI-  LIFETIME (UNITS 10**-10)

S22T   H   11     3.5      3.4      1.23    WANG      61 PBC
S22T   H   18     1.28     0.41     0.25    FOWLER    61 PBC
S22T   H (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22T      517     1.66     0.15     0.14    JAUNEAU   63 FBC
S22T       62     1.55     0.31     0.31    SCHNEIDER 63 HBC
S22T      356     1.77     0.12             CARMONY   64 HBC
S22T      794     1.69     0.07             HUBBARD   64 HBC
S22T      299     1.80     0.16             LONDON    66 HBC                   6/66
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                              22  XI- PARTIAL DECAY MODES

S22P1     XI- INTO LAMBDA PI-                                    S18S 8
S22P2     XI- INTO LAMBDA E- NEUTRINO                            S18S 3S 1
S22P3     XI- INTO NEUTRON PI-                                   S17S 8
S22P4         XI- INTO LAMBDA MU- NEUTRINO                       S18S 4S 2
S22P5         XI- INTO SIGMA0 E- NEUTRINO                        S21S 3S 1
S22P6         XI- INTO SIGMA0 MU- NEUTRINO                       S21S 4S 2
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                              22  XI- BRANCHING RATIOS

S22R1  *  XI- INTO (LAMBDA E- NEU)/(LAMBDA PI-)                (P2)/(P1)
S22R1  *    1    0.0017   OR LESS           CARMONY + 63 HBC QUOTED BY TICHO
S22R1  *         0.005   OR LESS            BERGE     66 HBC                   7/66
S22R1       1    0.006    0.006             LONDON    66 HBC                   6/66

S22R2  *  XI- INTO (NEUTRON PI-)/(LAMBDA PI-)                  (P3)/(P1)
S22R2  *         0.005   OR LESS            FERRO-LUZ 63 HBC

S22R3  *      XI- INTO (LAMBDA MU- NEUTRINO)/TOTAL             (P4)/TOTAL
S22R3  *         0.012   OR LESS            BERGE     66 HBC                   7/66

S22R4  *      XI- INTO (SIGMA0 E- NEUTRINO)/TOTAL              (P5)/TOTAL
S22R4  *         0.003   OR LESS            BERGE     66 HBC                   7/66

S22R5  *      XI- INTO (SIGMA0 MU- NEUTRINO)/TOTAL             (P6)/TOTAL
S22R5  *         0.005   OR LESS            BERGE     66 HBC                   7/66
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                              22  XI- DECAY PARAMETERS

S22A   *  ALPHA XI-

S22A            -0.44      0.11             JAUNEAU   63 FBC
S22A   H   62   -0.73      0.21             SCHNEIDER 64 HBC
S22A   H (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22A      240   -0.5       0.35             BADIER    64 HBC                   7/66
S22A      356   -0.62      0.12             CARMONY   64 HBC
S22A   * 1004   -0.368     0.057            BERGE     66 HBC                   7/66

S22A      364   -0.47      0.12             LONDON    66 HBC  USING A-LAMB =0.62   6/66
S22A     2529   -0.355     0.043            MERRILL   66 HBC  USING A-LAMB=0.762   8/66

S22B   *  BETA XI-
                                                                            3
S22B            -0.24      0.53             JAUNEAU   63 FBC
S22B   H   62    0.44      0.36             SCHNEIDER 64 HBC
S22B   H (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22B      356    0.63      0.16             CARMONY   64 HBC
S22B      364    0.0       0.3              LONDON    66 HBC                   6/66

S22C   *  GAMMA XI-

S22C             0.87      0.05      0.28   JAUNEAU   63 FBC
S22C      356    0.46      0.28             CARMONY   64 HBC
S22C   H   62    0.52      0.44             SCHNEIDER 64 HBC
S22C   H (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22C      364    0.88      0.09             LONDON    66 HBC                   6/66

S22F   *  PHI ANGLE (TAN(PHI)=BETA/GAMMA)  (DEGREE)

S22F            -16.      37.               JAUNEAU   63 FBC
S22F      356   54.0      25.0              CARMONY   64 HBC
S22F   H   62   45.0      30.0              SCHNEIDER 64 HBC
S22F   H (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22F   * 1004    0.45     10.7              BERGE     66 HBC                   7/66
S22F     2529    1.0       8.0              MERRILL   66 HBC  USING A-LAMB=0.762   8/66
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CODE		EVENTS ABOVE BACKGROUND	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

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23 XI 0 (1314,JP=1/2) I=1/2

23 XI MASS DIFFERENCE (-)-(0)(MEV)

CODE		EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	COMMENTS	DATE
S23D		23	6.8	1.6		JAUNEAU	63	FBC		
S23D		45	6.1	1.6		CARMONY	64	HBC		
S23D		29	6.9	2.2		LONDON	66	HBC		6/66

23 XI 0 LIFETIME (UNITS 10**-10)

CODE		EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	COMMENTS	DATE
S23T		24	3.9	1.4	0.80	JAUNEAU	63	FBC		
S23T		45	3.5	1.0	0.8	CARMONY	63	HBC		
S23T		101	2.5	0.4	0.3	HUBBARD	63	HBC		

23 XI 0 PARTIAL DECAY MODES

CODE	MODE	
S23P1	XI 0 INTO LAMBDA PI0	S18S 9
S23P2	XI 0 INTO PROTON PI-	S16S 8
S23P3	XI 0 INTO PROTON E- NEU	S16S 3S 1
S23P4	XI 0 INTO SIGMA+ E- NEU	S19S 3S 1
S23P5	XI 0 INTO SIGMA- E+ NEU	S20S 3S 1
S23P6	XI 0 INTO SIGMA+ MU- NEUTRINO	S19S 4S 2
S23P7	XI 0 INTO SIGMA- MU+ NEUTRINO	S20S 4S 2
S23P8	XI 0 INTO PROTON MU- NEUTRINO	S16S 4S 2

23 XI 0 BRANCHING RATIOS

CODE		EVENTS	QUANTITY	REFERENCE	YR	TECN	COMMENTS	DATE
S23R1	*	XI 0 INTO(PROTON PI-)/(LAMBDA PI0)					(P2)/(P1)	
S23R1	*	0	0.027 OR LESS	TICHO	63	HBC		
S23R1	*	0	0.005 OR LESS	HUBBARD	66	HBC		7/66
S23R2	*	XI 0 INTO(PROTON E- NEU)/(LAMBDA PI0)					(P3)/(P1)	
S23R2	*	0	0.027 OR LESS	TICHO	63	HBC		
S23R2		0	0.006 OR LESS	HUBBARD	66	HBC		7/66
S23R3	*	XI 0 INTO(SIGMA+ E- NEU)/(LAMBDA PI0)					(P4)/(P1)	
S23R3	*	0	0.013 OR LESS	TICHO	63	HBC		
S23R3		0	0.007 OR LESS	HUBBARD	66	HBC		7/66
S23R4	*	XI 0 INTO (SIGMA- E+ NEUTRINO)/TOTAL					(P5)/TOTAL	
S23R4	*	0	0.006 OR LESS	HUBBARD	66	HBC		7/66
S23R5	*	XI 0 INTO (SIGMA+ MU- NEUTRINO)/TOTAL					(P6)/TOTAL	
S23R5	*	0	0.007 OR LESS	HUBBARD	66	HBC		7/66
S23R6	*	XI 0 INTO (SIGMA- MU+ NEUTRINO)/TOTAL					(P7)/TOTAL	
S23R6	*	0	0.006 OR LESS	HUBBARD	66	HBC		7/66
S23R7	*	XI 0 INTO (PROTON MU- NEUTRINO)/TOTAL					(P8)/TOTAL	
S23R7	*	0	0.006 OR LESS	HUBBARD	66	HBC		7/66

23 XI 0 DECAY PARAMETER

S23A * ALPHA XI 0

CODE		EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	COMMENTS	DATE
S23A			-0.09	0.42		CARMONY	65	HBC		
S23A	*		-0.149	0.154		BERGE	66	HBC		7/66
S23A		46	-0.2	0.4		LONDON	66	HBC	USING A-LAMB=0.62	6/66
S23A		490	-0.33	0.10		MERRILL	66	HBC	A-LAM=0.690+-.048	8/66

S23F * PHI ANGLE XI0 (TAN(PHI)=BETA/GAMMA) (DEGREE)

CODE		EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	COMMENTS	DATE
S23F	N	146	-2.9	23.5		BERGE	66	HBC		7/66
S23F	N	490	107.0	38.0		MERRILL	66	HBC	USING A-LAMB=0.642	8/66
S23F	N	THE LIKELIHOOD FUNCTION FOR COMBINED DATA IS VERY NON-GAUSSIAN. THE								7/66
S23F	N	DATA ARE CONSISTENT (2.2 S.D.) WITH PHI BETWEEN -25 AND +225 DEG.								7/66

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24 OMEGA- (1675,JP=3/2+) I=0

S24 * QUANTUM NUMBERS ASSIGNED FROM SU3

24 OMEGA- MASS (MEV)

CODE		EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	COMMENTS	DATE
S24M	*	1	1620.0	25.0	10.0	EISENBERG	54	EMUL		
S24M	S	1	1673.0	8.0		ABRAMS	64	HBC		7/66
S24M	S	1	1686.0	12.0		BARNES 1	64	HBC		7/66
S24M	S	1	1674.0	3.0		BARNES 2	64	HBC		7/66
S24M	S	1	1666.0	8.0		COLLEY	65	HBC		6/66
S24M	S	1	1671.0	5.0		RICHARDSO	65	HBC		7/66
S24M	S	ABOVE EVENTS INCLUDED IN SAMIOS RVUE								7/66
S24M		6	1674.0	3.0		SAMIOS	65	RVUE		6/66

24 OMEGA- LIFETIME (UNITS 10**-10 SEC)

CODE		EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	COMMENTS	DATE
S24T	S	1	1.63			ABRAMS	64	HBC		7/66
S24T	S	1	0.7			BARNES 1	64	HBC		7/66
S24T	S	1	1.4			BARNES 2	64	HBC		7/66
S24T	S	1	1.85			COLLEY	65	HBC		7/66
S24T	S	1	1.5			RICHARDSO	65	HBC		7/66
S24T	S	ABOVE EVENTS INCLUDED IN SAMIOS RVUE								7/66
S24T		7	1.5	0.5		SAMIOS	65	RVUE		6/66

REFERENCES FOR TABLES ON STABLE PARTICLES

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20 SIGMA-(1198,JP=1/2+)I=1

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
BROWN	58	CERN CONF 270	BROWN,GLASER,GRAVES,PERL,CRONIN + /// MICH		S20
EISLER	58	NC SERIO 10 150	EISLER,BASSI,CONVERSI + / COL+BNL+BOL+PISA		S20
BROWN	57	PR 108 1036	J BROWN, D GLASER, M PERL / MICHIGAN + BNL		S20
BARKAS	61	PR 124 1209	BARKAS,DYER,MASON,NICKOLS,SMITH ////// LRL		S20
CHIESA	61	NC 19 1171	A M CHIESA,B QUASSIATI,G RINAUDO /// TURIN		S20
HUMPHREY	62	PR 127 1305	W E HUMPHREY,R R ROSS //////////////// LRL		S20
TRIPP	62	PRL 9 66	R D TRIPP,M WATSON,M FERRO-LUZZI ///// LRL		S20
BARKAS	63	PRL 11 26	W H BARKAS,J N DYER,H H HECKMAN ////// LRL		S20
COURANT	63	SIENA 1 15	COURANT,FILTHUTH,BURNSTEIN+/// CERN+MD+NRL		S20
BURNSTEI	64	PRL 13 66	BURNSTEIN,DAY,KEHOE,SECHI ZORN,SNOW// MARY		S20
COURANT	64	PR 136 B 1791	COURANT,FILTHUTH+///CERN+HEIDLB+MD+NRL+BNL		S20
MILLER	64	PL 11 262	MILLER,STANNARD,BEZAGUET+ /LOND+PARIS+BERG		S20
MURPHY	64	PR 134 B 188	C THORNTON MURPHY ////////////// WISCONSIN		S20
NAUENBER	64	PRL 12 679	NAUENBERG,SCHMIDT,MARATECK+ /COL+RUT+PRINC		S20
BAZIN	65	PR 140 B 1358	BAZIN,PLANO,SCHMIDT + //PRINC+RUTG+COLUM		S20
CHANG	65	NEVIS 145 THESIS	CHUNG YUN CHANG //////////////// COLUMBIA		S20
DOSCH	65	PL 14 239	DOSCH,ENGELMANN,FILTHUTH,HEPP,KLUGE+ /HEID		S20
SCHMIDT	65	PR 140 B 1328	P SCHMIDT ///////////////////////// COLUMBIA		S20
BANGERTE	66	PRL TO BE PUBLIS.	BANGERTER,GALTIERI,BERGE,MURRAY+ // LRL		S20

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21 SIGMA 0(1193,JP=1/2+)I=1

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
DAVIS	62	PR 127 605	D DAVIS,R SETTI,M RAYMOND,G TOMASIN ///CHI		S21
COURANT	63	PRL 10 409	COURANT,FILTHUTH,FRANZINI+//CERN+UMD+USNRL		S21
BURNSTEI	64	PRL 13 66	BURNSTEIN,DAY,KEHOE,SECHI ZORN,SNOW //MARY		S21
DOSCH	65	PL 14 239	DOSCH,ENGELMANN,FILTHUTH,HEPP,KLUGE+ /HEID		S21
SCHMIDT	65	PR 140 B 1328	P SCHMIDT ///////////////////////// COLUMBIA		S21

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22 XI - (1321,JP=1/2) I=1/2

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
FOWLER	61	PRL 6 134	FOWLER,BIRGE,EBERHARD,ELY,GOOD,POWELL+/LRL		S22
WANG	61	JETP 13 512	K WANG,T WANG,VIRYASOV,TING,SOLOVEV+//JINR		S22
BERTANZA	62	PRL 9 229	BERTANZA,BRISSON,GOLDBERG,GRAY+/BNL+SYRACU		S22
BROWN	62	PRL 8 255	BROWN,CULWICK,FOWLER,GAILLOUD +///BNL+YALE		S22
FERROLUZ	63	PR 130 1568	FERRO-LUZZI,ALSTON,ROSENFELD,WOJCICKI//LRL		S22
JAUNEAU	63	SIENA CONF 4	JAUNEAU+ ///// PARIS+CERN+LOND+RUTH+BERGEN		S22
ALSO	63	PL 4 49	JAUNEAU+ ///// PARIS+CERN+LOND+RUTH+BERGEN		S22
SCHNEIDE	63	PL 4 360	H SCHNEIDER /////////////////////////// CERN		S22
TICHO	63	BNL CONF 410	HAROLD K TICHO ///////////////////////// UCLA		S22
CARMONY	64	PRL 12 482	CARMONY,PJERROU,SCHLEIN,SLATER,STORK+/UCLA		S22
BADIER	64	DUBNA CONF	BADIER,DEMOULIN,BARLOUTAUD+ /PARIS+SAC+ZEE		S22
HUBBARD	64	PR 135 B 183	HUBBARD,BERGE,KALBFLEISCH,SHAFER +/////LRL		S22
PJERROU	65	PRL 14 275	+ SCHLEIN,SLATER,SMITH,STORK,TICHO // UCLA		S22
BERGE	66	PR 147 945	BERGE,EBERHARD,HUBBARD,MERRILL + ///// LRL		S22
LONDON	66	PR 143 1034	LONDON,RAU,GOLDBERG,LICHTMAN+//BNL+SYRACUS		S22
MERRILL	66	BERKELEY CONF	MERRILL,SHAFER,BERGE //LRL		S22
CF.	66	UCRL 16455	DEANE MERRILL (THESIS, BERKELEY) ///// LRL		S22

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
CARMONY	64	PRL 12 482	CARMONY,PJERROU,SCHLEIN,SLATER,STORK+/UCLA	J	S22
SHAFER	65	UCRL 11884	J BUTTON SHAFER, DEANE MERRILL ///// LRL	J	S22
MERRILL	66	UCRL 16455	DEANE MERRILL (THESIS, BERKELEY) /// LRL	J	S22

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23 XI 0(1314,JP=1/2)I=1/2

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
ALVAREZ	59	PRL 2 215	ALVAREZ,EBERHARD,GOOD,GRAZIANO,TICHO+//LRL		S23
JAUNEAU	63	SIENA CONF 1 1	JAUNEAU+ ///// PARIS+CERN+LOND+RUTH+BERGEN		S23
ALSO	63	PL 4 49	JAUNEAU+ ///// PARIS+CERN+LOND+RUTH+BERGEN		S23
TICHO	63	BNL CONF 410	HAROLD K TICHO //////////////////////////UCLA		S23
CARMONY	64	PRL 12 482	CARMONY,PJERROU,SCHLEIN,SLATER,STORK+/UCLA		S23
HUBBARD	64	PR 135 B 183	HUBBARD,BERGE,KALBFLEISCH,SHAFER +/////LRL		S23
PJERROU	65	PRL 14 275	+ SCHLEIN,SLATER,SMITH,STORK,TICHO // UCLA		S23
BERGE	66	PR 147 945	BERGE,EBERHARD,HUBBARD,MERRILL + ///// LRL		S23
HUBBARD	66	UCRL 11510	J RICHARD HUBBARD (THESIS,BERKELEY) // LRL		S23
LONDON	66	PR 143 1034	LONDON,RAU,GOLDBERG,LICHTMAN+//BNL+SYRACUS		S23
MERRILL	66	BERKELEY CONF	MERRILL,SHAFER,BERGE //LRL		S23
CF.	66	UCRL 16455	DEANE MERRILL (THESIS, BERKELEY) ///// LRL		S23

24 OMEGA-(1675,JP=3/2+) I=0

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
EISENBER	54	PR 96 541	Y EISENBERG //////////////////////////CORNELL		S24
ABRAMS	64	PRL 13 670	+ BURNSTEIN,GLASSER + ///// MARYLAND+USNRL		S24
BARNES 1	64	PRL 12 204	V E BARNES,CONNOLLY,CRENNELL,CULWICK+//BNL		S24
BARNES 2	64	PL 12 134	V E BARNES,CONNOLLY,CRENNELL,CULWICK+//BNL		S24
COLLEY	65	PL 19 152	COLLEY,DODD + // BIR+GLA+IC+MUN+OXF+RHEL		S24
RICHARDS	65	BAPS 10 115	RICHARDSON,BARNES,CRENNEL+ // BNL+SYRACUSE		S24
SAMIOS	65	ARGONNE CONF 189	N P SAMIOS ////////////////////// (RVUE) BNL		S24

DATA ON MESON RESONANCES

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CODE     EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS    DATE
    ABOVE BACKGROUND                                                       PUNCHED

        N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS
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σ (390)

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7  SIGMA MESON (390,JPG=   )  I=C
      PROBABLY 0(0++)
EVIDENCE NOT COMPELLING, OMITTED FROM TABLE AND LISTING.              7/66
FOR REFERENCES, SEE EARLIER VERSIONS OF UCRL 8030.
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S^0 (720)

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14  SO (PI PI) (700,JPG=0++)  I=C

        EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

                14  SO (PI PI) (700)  MASS (MEV)

U14M              700.0                  FELDMAN   65 SPRK
U14M              720.0                  HAGOPIAN  65 HBC
U14M    *         740.0                  WOLF      65 RVUE                      6/66

                14  SO (PI PI) (700)  WIDTH (MEV)

U14W               50.0                  FELDMAN   65 SPRK
U14W               50.0                  HAGOPIAN  65 HBC
U14W    *          90.0                  WOLF      65 RVUE                      6/66
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ω (783)

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1  OMEGA (780,JPG=1--)  I=0

                1  OMEGA  MASS (MEV)

U 1M       400  782.0     1.0            ALFF      62 HBC
U 1M        64  779.4     1.4            ARMENTERO 62 HBC
U 1M       650  782.0                    MURRAY    63 HBC
U 1M        34  784.0     1.0            ARMENTERO 63 HBC
U 1M       220  781.0     2.0            KRAEMER   64 DBC
U 1M            785.6     1.2            MILLER D  65 HBC   SEEN WITH K+K-
U 1M            780.8     2.0            MILLER D  65 HBC   SEEN WITH K1 K2     8/66
U 1M       333  786.0     1.0            JAMES     66 HBC                       6/66

                1  OMEGA FULL WIDTH (MEV)

U 1W        34    9.0     3.0            ARMENTERO 63 HBC
U 1W             13.4     2.0            MILLER D  65 HBC   SEEN WITH K+ K-
U 1W             11.6     3.0            MILLER D  65 HBC   SEEN WITH K1 K2     8/66
U 1W    *  333   20.0   OR LESS          JAMES     66 HBC                       6/66

                1  OMEGA PARTIAL DECAY MODES

U 1P1      OMEGA INTO PI+ PI- PIO                           S 8S 8S 9
U 1P2      OMEGA INTO PI+ PI-                               S 8S 8
U 1P3      OMEGA INTO PI+ PI- GAMMA                         S 8S 8S 0
U 1P4      OMEGA INTO PIO GAMMA                             S 9S 0
U 1P5      OMEGA INTO 2PIO GAMMA                            S 9S 9S 0
U 1P6      OMEGA INTO MU+ MU-                               S 4S 4
U 1P7      OMEGA INTO E+ E-                                 S 3S 3
U 1P8      OMEGA INTO ETA GAMMA                             S14S 0
U 1P9      OMEGA INTO ETA PIO                               S14S 9

                1  OMEGA  BRANCHING RATIOS

U 1R1   *  OMEGA INTO NEUTRAL/(PI+ PI- PIO)                (P4+P5)/(P1)
U 1R1           0.10     0.04            ALFF      62 HBC
U 1R1           0.17     0.04            ARMENTERO 63 HBC
U 1R1      20   0.11     0.02            BUSCHBECK 63 HBC
U 1R1      35   0.08     0.03            KRAEMER   64 DBC
U 1R1           0.13     0.035           MILLER D  65 HBC
U 1R1     348   0.097    0.016           FLATTE    65 HBC
U 1R1           0.099    0.004           ALFF-STEI 66 HBC                       6/66
U 1R1           0.06     0.05      0.02  JAMES     66 HBC                       6/66

U 1R2   *  OMEGA INTO (PI+ PI-)/(PI+ PI- PIO)              (P2)/(P1)
U 1R2   *       0.010 OR LESS            BUTTON    61 HBC
U 1R2   *       0.02 OR LESS             ALFF      62 HBC
U 1R2   *       0.07                     ALITTI    63 HBC
U 1R2   *       0.05 OR LESS             ARMENTERO 63 HBC
U 1R2   *  100  0.05 OR GREATER          FICKINGER 63 HBC
U 1R2   *       0.02                     JAMES     63 HBC
U 1R2   *   32  0.045    0.016     0.01  MURRAY    63 HBC  NO INTERFERENCE

U 1R2   *   42  0.006  - 0.002  OR MORE  HUWE      64 HBC  - INTERFERENCE
U 1R2   *   42  0.11   + 0.01  OR LESS   HUWE      64 HBC  + INTERFERENCE
U 1R2   *       0.05 OR LESS             KRAEMER   64 DBC
U 1R2   *       0.005 OR LESS            LUTJENS   64 RVUE NO INTERFERENCE
U 1R2   *       0.018    0.012    0.006  WALKER    64 RVUE

U 1R2   *       0.04 OR GREATER          BATON     65 HBC
U 1R2   *       0.010 OR LESS            CLARK     65 SPRK                      6/66

U 1R2           0.029    0.011    0.009  FLATTE    65 HBC  INTERFERENCE
U 1R2           0.082    0.020           FLATTE    65 HBC  NO INTERFERENCE
U 1R2   *       0.035 OR LESS            MILLER D  65 HBC

U 1R3   *  OMEGA INTO (PI+PI-PIO)/(PIO GAMMA)              (P1)/(P4)
U 1R3   *       8.0    +-1.5  OR LESS    BARMIN    64 PXBC
U 1R3          10.0      3.0             BELYAKOV  64 PXBC

U 1R4   *  OMEGA INTO (PI+ PI- GAMMA)/(PI+ PI- PIO)        (P3)/(P1)
U 1R4   *       0.05   OR LESS           FLATTE    65 HBC

U 1R5   *  OMEGA INTO(E+ E-)/(PI+ PI- PIO)  (UNITS 10**-3) (P7)/(P1)
U 1R5   *   3  10.0    OR LESS           MURRAY    63 HBC
U 1R5   *       3.9      1.5   OR LESS   BARMIN    63 PBC
U 1R5   *   1   2.8    OR LESS           BEZAGUET  64 FBC
U 1R5       3   0.20     0.12            BINNIE    65 SPRK                      6/66
U 1R5   *       1.4    OR LESS           GALTIERI  65 HBC
U 1R5       0   0.1      0.12     0.08   ZDANIS    65 SPRK

U 1R6   *  OMEGA INTO (MU+ MU-)/(PI+ PI- PIO)(UNITS 10**-3) (P6)/(P1)
U 1R6   *       1.2    OR LESS           GALTIERI  65 HBC
U 1R6   *   0   1.0    OR LESS           ZDANIS    65 SPRK

U 1R7   *  OMEGA INTO (2PIO GAMM)/(PIO GAMMA)              (P5)/(P4)
U 1R7   *       0.1    OR LESS           BARMIN    64 PXBC

U 1R8   *  OMEGA INTO(ETA PIO +ETA GAM)/(PI+PI-PIO)        (P8+P9)/(P1)
U 1R8   *       0.017  OR LESS           FLATTE    65 HBC
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η′ (958)

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2    ETA PRIME (960,JPG=0-+)  I=0
     KNOWN EARLIER AS XO OR ETA*

                2    ETA PRIME MASS (MEV)

U 2M        85  957.0                    DAUBER    64 HBC
U 2M            958.0     1.0            KALBFLEIS 64 HBC                       6/66
U 2M            957.0     3.0            BADIER    65 HBC
U 2M         7  955.0    10.0            COHN      66 DBC                       6/66
U 2M            959.0     3.0            LONDON    66 HBC                       6/66

                2    ETA PRIME WIDTH (MEV)

U 2W    *   85    4.0 OR LESS            DAUBER    64 HBC
U 2W    *         7.0 OR LESS            KALBFLEIS 64 HBC                       6/66
U 2W    *        30.0 OR LESS            BADIER    65 HBC
U 2W    *        15.0 OR LESS            LONDON    66 HBC                       6/66

                2    ETA PRIME PARTIAL DECAY MODES

U 2P1          ETA PRIME INTO PI+ PI- ETA                   S 8S 8S14

U 2P2          ETA PRIME INTO RHO GAMMA                     U 9S 0
U 2P3          ETA PRIME INTO PIO PIO ETA                   S 9S 9S14
U 2P4        ETA PRIME INTO PIO E+ E-                       S 9S 3S 3
U 2P5        ETA PRIME INTO PI+ PI- E+ E-                   S 8S 8S 3S 3
U 2P6        ETA PRIME INTO ETA E+ E-                       S14S 3S 3
U 2P7        ETA PRIME INTO PIO RHO 0                       S 9U 9
U 2P8        ETA PRIME INTO PIO OMEGA                       S 9U 1
U 2P9          ETA PRIME INTO PI+ PI- GAMMA                 S 8S 8S 0

                2    ETA PRIME BRANCHING RATIOS

U 2R1   *      ETA PRIME INTO (PI+ PI- ETA)/TOTAL          (P1)/TOTAL

U 2R2   *      ETA PRIME INTO (PI+ PI- ETA NEUTRALS)/TOTAL
U 2R2      39    0.4      0.1            LONDON    66 HBC                       6/66

U 2R3   *      ETA PRIME INTO (RHO GAMMA) / TOTAL          (P2)/TOTAL
U 2R3   B  35    0.34     0.09           BADIER    65 HBC
U 2R3   B  CONTROVERSIAL BACKGROUND SUBTRACTION
U 2R3      20    0.2      0.1            LONDON    66 HBC                       6/66

U 2R4   *      ETA PRIME INTO (RHO GAMMA) / (PI PI ETA)    (P2)/(P1+P3)
U 2R4            0.25     0.14           DAUBER    64 HBC

U 2R5   *      ETA PRIME INTO (PI+ PI- ETA CHARGED)/TOTAL
U 2R5      44    0.12     0.02           KALBFLEIS 64 HBC                       6/66
U 2R5            0.07     0.04           BADIER    65 HBC
U 2R5      43    0.10     0.04           LONDON    66 HBC                       6/66

U 2R6   *      ETA PRIME INTO (NEUTRALS)/TOTAL
U 2R6   *        0.24     0.17           BADIER    65 HBC
U 2R6      54    0.25     0.05           KALBFLEIS 64 HBC                       6/66
U 2R6      32    0.3      0.1            LONDON    66 HBC                       6/66

U 2R7   *    ETA PRIME INTO (PIO E+ E-)/TOTAL              (P4)/TOTAL
U 2R7   *        LESS THAN 0.013         RITTENBER 65 HBC                       6/66

U 2R8   *    ETA PRIME INTO (PI+ PI- E+ E-)/TOTAL          (P5)/TOTAL
U 2R8   *        LESS THAN 0.006         RITTENBER 65 HBC                       6/66

U 2R9   *    ETA PRIME INTO (ETA E+ E-)/TOTAL              (P6)/TOTAL
U 2R9   *        LESS THAN 0.011         RITTENBER 65 HBC                       6/66

U 2R10  *    ETA PRIME INTO (PIO RHO 0)/TOTAL              (P7)/TOTAL
U 2R10  *        LESS THAN 0.04          RITTENBER 65 HBC                       6/66

U 2R11  *    ETA PRIME INTO (PIO OMEGA)/TOTAL              (P8)/TOTAL
U 2R11  *        LESS THAN 0.08          RITTENBER 65 HBC                       6/66
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H (975)

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U35  H (975)  MASS  (MEV)

U35M       90  975.0     15.0            BARTSCH   64 HBC     4.0 PI+ P         8/66

                U35  H (975) WIDTH  (MEV)

U35W       90  120.0                     BARTSCH   64 HBC     4.0 PI+ P         8/66
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φ (1019)

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4  PHI (1020,JPG=1-- ) I=0

                4  PHI  MASS (MEV)

U 4M           1017.0     2.0            ARMENTERO 63 HBC
U 4M           1019.0     2.0            SCHLEIN   63 HBC    2.0 K- P
U 4M           1018.6     0.5            MILLER    65 HBC                       8/66
U 4M           1020.0     2.0            LONDON    66 HBC                       6/66

                4  PHI  WIDTH (MEV)

U 4W              3.4     1.7            ARMENTERO 63 HBC
U 4W    *  34     5.0   OR LESS          SCHLEIN   63 HBC
U 4W              3.5     1.0            MILLER D  65 HBC                       8/66
U 4W              6.0     4.0            LONDON    66 HBC                       6/66

                4  PHI PARTIAL DECAY MODES

U 4P1      PHI INTO K+ K-                                   S10S10
U 4P2      PHI INTO K01 K02                                 S11S11
U 4P3      PHI INTO RHO PI                                  U 9S 8
U 4P4      PHI INTO PI+ PI-                                 S 8S 8
U 4P5      PHI INTO E+  E-                                  S 3S 3
U 4P6      PHI INTO MU+ MU-                                 S 4S 4
U 4P7      PHI INTO PIO GAMMA                               S 9S 0
U 4P8      PHI INTO ETA GAMMA                               S14S 0
U 4P9      PHI INTO PI+PI-GAMMA                             S 8S 8S 0
U 4P10     PHI INTO OMEGA GAMMA                             U 1S 0
U 4P11     PHI INTO ETA   PI 0                              S14S 9
U 4P12     PHI INTO PI+  PI-  PI 0                          S 8S 8S 9
U 4P13     PHI INTO RHO GAMMA                               U 9S 0
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CODE     EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS     DATE
   ABOVE BACKGROUND                                                          PUNCHED

      N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

                        4  PHI  BRANCHING RATIOS

U 4R1   *   PHI INTO (K1 K2)/(K1 K2 AND K+ K-)                 (P2)/(P1+P2)
U 4R1        10    0.40      0.10          SCHLEIN    63 HBC
U 4R1              0.46      0.04          LINDSEY    66 HBC                        8/66

U 4R1              0.41      0.07          LONDON     66 HBC                        6/66

U 4R2   *   PHI INTO (RHO PI)/(K KBAR)                         (P3)/(P1+P2)
U 4R2              0.14      0.08          LINDSEY    66 HBC                        8/66
U 4R2              0.3       0.15          LONDON     66 HBC                        6/66

U 4R3   *   PHI INTO (PI+ PI-)/(K KBAR)                        (P4)/(P1+P2)
U 4R3   *          0.2 OR LESS             LONDON     66 HBC                        6/66

U 4R4   *   PHI INTO (E+ E-)/(K KBAR)                          (P5)/(P1+P2)
U 4R4   *        0.0036 OR LESS            GALTIERI   65 HBC

U 4R5   *   PHI INTO (MU+ MU-)/(K KBAR)                        (P6)/(P1+P2)
U 4R5   *        0.0053 OR LESS            GALTIERI   65 HBC

U 4R6   *   PHI INTO (PI+PI-GAM)/(K KBAR)                      (P9)/(P1+P2)
U 4R6   *        0.05   OR LESS            LINDSEY    66 HBC

U 4R7   *   PHI INTO (OMEGA GAM)/(K KBAR)                      (P1C)/(P1+P2)
U 4R7   *        0.09   OR LESS            LINDSEY    66 HBC

U 4R8   *   PHI INTO (ETA NEUTRALS) / (K KBAR)                 (P8+P11)/(P1+P2)
U 4R8   *        0.15   OR LESS            LINDSEY    66 HBC

U 4R9   *   PHI INTO (K+ K-)/TOTAL                              (P1)/TOTAL
U 4R9   B          0.26      0.06          BADIER     65 HBC
U 4R9   B   CONTROVERSIAL BACKGROUND SUBTRACTION
U 4R9        250   0.48      0.04          LINDSEY    66 HBC                        6/66

U 4R10  *   PHI INTO (K1 K2)/TOTAL                              (P2)/TOTAL
U 4R10  B          0.23      0.06          BADIER     65 HBC
U 4R10  B   CONTROVERSIAL BACKGROUND SUBTRACTION
U 4R10       170   0.40      0.04          LINDSEY    66 HBC                        6/66

U 4R11  *   PHI INTO (PI+ PI- PIO)/TOTAL                        (P12)/TOTAL
U 4R11  B     57   0.51      0.09          BADIER     65 HBC
U 4R11  B   CONTROVERSIAL BACKGROUND SUBTRACTION
U 4R11       110   0.14      0.10          LINDSEY    66 HBC                        6/66

U 4R12  *   PHI INTO (RHO PI)/TOTAL                             (P3)/TOTAL
U 4R12        30   0.12      0.08          LINDSEY    66 HBC                        6/66

U 4R13  *      PHI INTO (PI+ PI- PIO)/(K1 K2)                   (P12)/(P2)
U 4R13  *          0.3 OR LESS             BERLEY     65 HBC                        6/66

U 4R14  *      PHI INTO (ETA GAMMA)/TOTAL                       (P8)/TOTAL
U 4R14  *          0.2 OR LESS             BADIER     65 HBC                        6/66
U 4R14  *     0    0.08 OR LESS            LINDSEY    66 HBC                        6/66

U 4R15  *      PHI INTO (RHO GAMMA) / TOTAL                     (P13)/TOTAL
U 4R15  *     0    0.02  OR LESS           LINDSEY    66 HBC                        8/66

U 4R16  *      PHI INTO (OMEGA GAMMA) / TOTAL                   (P10)/TOTAL
U 4R16  *     0    0.05  OR LESS           LINDSEY    66 HBC                        8/66
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KK̄₀ (1068)

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3  K KBAR)0 (1068,JPG=0++)  I=0

                     NAMED S* BY CRENNELL ET AL.
                     MAY BE JUST LARGE S-WAVE SCATTERING LENGTH

                        3  K KBAR)0 MASS (MEV)

U 3M    *    16 1020.0                     ALEXANDER 62 HBC
U 3M    *       1000.0    APPROX           BINGHAM   62 PBC
U 3M    *       1000.0    APPROX           BIGI      62 HBC
U 3M    *    30 1030.0    APPROX.          BALTAY    64 HBC
U 3M    *       1025.0    APPROX.          BARMIN    64 HLBC                        6/66
U 3M         20 1068.0     10.0            CRENNELL  66 HBC          6.0 PI- P      6/66
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                        3  K KBAR)0  WIDTH  (MEV)

U 3W         20   80.0     15.0            CRENNELL  66 HBC                         6/66

                        3  K KBAR)0  PARTIAL DECAY MODES

U 3P1          KKBAR)0 INTO K KBAR                             S12S12
U 3P2          KKBAR)0 INTO PI PI                              S 9S 9
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                        3  K KBAR)0  BRANCHING RATIOS

U 3R1   *      KKBAR)0 INTO (PI PI)/(K KBAR)                   (P1)/(P2)
U 3R1   *         2.5    OR LESS           CRENNELL  66 HBC      90 PCT CONF LEV    7/66
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REFERENCES ON MESON RESONANCES


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AUTHOR    YR JOURNAL VOL. PAGE AUTHORS                               // LABORATORIES    CODE
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S⁰ (720)

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14 SO (PI PI)(700,JPG=0++)I=0

COHN      65 PRL 15 506        H O COHN,BUGG+//ORNL+TENN+UNCAR+COLU+EFINS          U14
CORBETT   65 NC 39 979         CORBETT,DAMERELL,MIDDLEMAS,CLEG+//CXF+RHEL          U14
FELDMAN   65 PRL 14 869        FELDMAN,FRATI,HALPERN,CHCUDRY+/PENNA+COLUM          U14
HAGOPIAN  65 PRL 14 1077       HAGOPIAN,SELOVE,ALIT+/PENNA+SACLAY+BOLOGNA          U14
WOLF      65 PL 19 328         G WOLF ///////////////////////////////// DESY       U14
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ω (783)

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1 OMEGA (780,JPG=1--)  I=0

MAGLIC    61 PRL 7 178         B MAGLIC,ALVAREZ,ROSENFELD,STEVENSON //LRL          U 1
PEVSNER   61 PRL 7 421         PEVSNER,KRAEMER,NUSSBAUM,RICHARD+///JHU+NW          U 1
XUONG     61 PRL 7 327         NGUYEN HUU XUONG,GERALD R LYNCH ///// LRL           U 1
ALFF      62 PRL 9 325         ALFF,BERLEY,COLLEY,GELFAND +//COLU+RUTGERS          U 1
ARMENTER  62 CERN CONF 90      R ARMENTEROS,R BUDDE + // CERN+COLL+FRANCE          U 1
BUTTON    62 PR 126 1858       BUTTON,KALBFLEISCH,LYNCH,MAGLIC + /// LRL           U 1
STEVENSO  62 PR 125 687        STEVENSON,ALVAREZ,MAGLIC,ROSENFELD /// LRL          U 1

ALITTI    63 NC 29 515         ALITTI,BATON,BERTHELOT+//LPCHE+PAR+EARI+BO          U 1
ARMENTER  63 SIENA CONF 1 296  ARMENTEROS,EDWARDS,JACOBSEN+ // CERN+PARIS          U 1
BARMIN    63 SIENA CONF 1 207  BARMIN,DOLGOLENKO,KRESTNIKOV+ ////// ITEP           U 1
BERTHELO  63 SIENA CONF 2 80   A BERTHELOT //////////////////// CEN-SACLAY         U 1
BUSCHBEC  63 SIENA CONF 1 166  BUSCHBECK,CZAPP+ /// VIENNA+CERN+AMSTERDAM          U 1
FICKINGE  63 PRL 10 457        W J FICKINGER,D K ROBINSON,E SALANT // BNL          U 1
JAMES     63 PREPR. TID-19082  F E JAMES, H L KRAYBILL ////////////// YALE         U 1
MURRAY    63 PL 7 358          MURRAY,FERROLUZZI,HUWE,SHAFER,SOLMITZ+/LRL          U 1
SHAFER    63 STANFORD CONF 386 J SHAFER,J MURRAY,M FERRO-LUZZI,D HUWE/LRL          U 1

BARMIN    64 JETP 18 1289      BARMIN,DOLGOLENKO,KRESTNIKOV + ///// ITEP           U 1
BELYAKOV  64 DUBNA CONF        BELYAKOV + /////////////// DUBNA+BUCHAREST          U 1
BEZAGUET  64 PL 12 70          BEZAGUET,NGUYEN KHAC,ROUSSET+//PAR+EERG+LO          U 1
HUWE      64 UCRL 11291 THESIS DARRELL O HUWE ///////////////////// LRL            U 1
KRAEMER   64 PR 136 B 496      KRAEMER,MADANSKY,MEER,FIELDS+//JHU+NW+WOOD          U 1
LUTJENS   64 PRL 12 517        G LUTJENS,J STEINBERGER /////// COLUMBIA            U 1
WALKER    64 PL 8 208          WALKER,BOYD,ERWIN,SATTERBLOM +// WISCONSIN          U 1

BATON     65 NC 35 713         BATON,BERTHELOT,DELER,BENEDETTI+/SAC+BOLOG          U 1
BINNIE    65 PL 18 348         BINNIE,DUANE,JANE,W JONES+//IC-LOND+MANCHS          U 1
                               [illegible]                                         U 1
FLATTE    65 PRL 14 1095       FLATTE,HUWE,MURRAY,SHAFER,SOLMITZ +/// LRL          U 1
GALTIERI  65 PRL 14 279        A BARBARO GALTIERI,R D TRIPP ///////// LRL          U 1
MILLER    65 CU-237 (NEVIS 131)DAVID C MILLER  (THESIS) //////// COLUMBIA          U 1
   MILLER 65 INCLUDES DATA OF GELFAND 63 BELOW                                     U 1
GELFAND   63 PRL 11 438        GELFAND,MILLER,NUSSBAUM,RATAU+ /COLUM+RUTG          U 1
ZDANIS    65 PRL 14 721        ZDANIS,MADANSKY,KRAEMER,HERTZBACH+/JHU+BNL          U 1

ALFF-STE  66 PR 145 1072       ALFF-STEINBERGER,BERLEY,BRUGGER+//CCL+RUTG          U 1
JAMES     66 PR 142 896        F E JAMES,KRAYBILL //////  YALE+BROOKHAVEN          U 1
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η′ (958)

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2   ETA PRIME (960,JPG=0-+)  I=0

DAUBER    64 DUBNA CONF 1 418  DAUBER,SLATER,L T SMITH,STORK,TICHO //UCLA          U 2
DAUBER 2  64 PRL 13 449        DAUBER,SLATER,SMITH,STORK,TICHO ///// UCLA          U 2
KALBFLEI  64 DUBNA CONF 1 414  G R KALBFLEISCH,O DAHL,A RITTENBERG // LRL          U 2

BADIER    65 PL 17 337         BADIER,DEMOULIN,BARLOUTAUD +/PAR+SAC+ZEEMA          U 2
KIENZLE   65 PL 19 438         KIENZLE,MAGLIC,LEVRAT,LEFEBVRES + /// CERN          U 2
RITTENBE  65 PRL 15 556        RITTENBERG,KALBFLEISCH //////////  LRL+BNL          U 2

COHN      66 PL 21 347         COHN,MCCULLOCH,BUGG,CONDO//ORNL+TENN+UNCAR          U 2
LONDON    66 PR 143 1034       LONDON,RAU,SAMIOS,GOLDBERG +//BNL+SYRACUSE          U 2
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H (975)

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U35  H (975, JPG=   )  I=0

BARTSCH   64 PL  11  167       AACHEN-ZEUTHEN-BIRM-BONN-HAMB-MUNCHEN COLL          U35
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φ (1019)

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4  PHI (1020,JPG=1--)  I=0

BERTANZA  62 PRL 9 180         BERTANZA,BRISSON,CONNOLLY,HART + //BNL+SYR          U 4
ARMENTER  63 SIENA CONF 2 70   ARMENTEROS,EDWARDS,ASTIER+//CERN+CDF-PARIS          U 4
SCHLEIN   63 PRL 10 368        SCHLEIN,SLATER,SMITH,STORK,TICHO //// UCLA          U 4

BADIER    65 PL 17 337         BADIER,DEMOULIN,BARLOUTAUD+//PAR+LPCHE+ZEE          U 4
BERLEY    65 PR 139 B 1097     D BERLEY,N GELFAND ////////// BNL+COLUMBIA          U 4
GALTIERI  65 PRL 14 279        A BARBARO GALTIERI,R D TRIPP ///////// LRL          U 4
MILLER    65 CU-237 (NEVIS 131)DAVID C MILLER  (THESIS) //////// COLUMBIA          U 4
   MILLER 65 INCLUDES DATA OF GELFAND 63 BELOW                                     U 4
GELFAND   63 PRL 11 438        GELFAND,MILLER,NUSSBAUM,KIRSCH+//COLU+RUTG          U 4
LINDSEY   66 PR  147  913      JAMES S LINDSEY, GERALD A SMITH  ////  LRL          U 4
   LINDSEY 66 INCLUDES DATA OF LINDSEY 65 AND 66 BELOW                             U 4
LINDSEY   65 PRL 15 221        JAMES S LINDSEY,GERALD A SMITH /////// LRL          U 4
LINDSEY   66 PL 20 93          J S LINDSEY,G A SMITH //////////////// LRL          U 4
LONDON    66 PR 143 1034       LONDON,RAU,SAMIOS,GOLDBERG +//BNL+SYRACUSE          U 4
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KK̄₀ (1068)

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K KBAR)0 (1068,JPG=0++)  I=0

ALEXANDE  62 PRL 9 460         ALEXANDER,DAHL,JACOBS,KALBFLEISCH + // LRL          U 3
BIGI      62 CERN CONF 247     A BIGI,S BRANDT, R CARRARA + ///////  CERN          U 3
BINGHAM   62 CERN CONF 240     H H BINGHAM,M BLOCH + //PARIS+EC POLY+CERN          U 3
ERWIN     62 PRL 9 34          ERWIN,HOYER,MARCH,WALKER,WANGLER //WIS+BNL          U 3

BALTAY    64 DUBNA CONF 1 409  BALTAY,LACH,CRENNELL,CHEN,STUMP +/YALE+BNL          U 3
BARMIN    64 DUBNA CONF 1 433  BARMIN,DOLGOLENKO,YEROFEEV,KRESTNI+// ITEP          U 3
CRENNELL  66 PRL 16 1025       CRENNELL,KALBFLEISCH,LAI,SCARR,SCHU+ //BNL          U 3
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CODE EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR TECN SIGN COMMENTS DATE
ABOVE BACKGROUND PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

f (1254)

5 F (1250,JPG=2++) I=0

5 F MASS (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
U 5M			1250.0	25.0		SELOVE	62	HBC			
U 5M			1260.0	35.0		VEILLET	63	FBC			
U 5M		5	1250.0			GUIRAGOSS	63	HBC			
J 5M		5	1260.0			BONDAR	63	HBC			
U 5M			1250.0			LEE	64	HBC			
U 5M		110	1250.0			CHUNG	65	HBC		3.2 PI- P	8/66
U 5M			1240.0	20.0		ACCENSI	66	HBC			6/66
J 5M			1275.0	25.0		WAHLIG	66	SPRK			6/66

5 F WIDTH (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
U 5W			100.0	25.0		SELOVE	62	HBC			
U 5W	*		200.0	OR LESS		VEILLET	63	FBC			
J 5W		85	160.0			BONDAR	63	HBC			
U 5W			130.0	20.0		LEE	64	HBC			
U 5W		110	110.0	10.0		CHUNG	65	HBC		3.2 PI- P	8/66
U 5W			102.0	46.0		ACCENSI	66	HBC			6/66

5 F PARTIAL DECAY MODES

Code	Mode	
U 5P1	F INTO PI+ PI-	S 8S 8
U 5P2	F INTO 2PI+ 2PI-	S 8S 8S 8S 8
J 5P3	F INTO K KBAR	S12S12

5 F BRANCHING RATIOS

Code	N	Quantity	Error+	Reference	Yr	Tecn	Comments	Date
U 5R1	*	F INTO (4PI)/(2PI)					(P2)/(P1)	
U 5R1		0.08	0.06	BONDAR	63	HBC		
J 5R1	*	0.04	OR LESS	CHUNG	65	HBC		
U 5R2	*	F INTO (K KBAR)/(PI PI)					(P3)/(P1)	
U 5R2	*	0.16	OR LESS	WANGLER	65	HBC		
J 5R2	*	0.04	OR LESS	CHUNG	65	HBC		
U 5R2	*	0.05	OR LESS	DEUTSCHMA	66	HBC		6/66

J 5R *FOR 2+ NONET SU3 RATES SEE E.G. GLASHOW,SOCOLOW, PRL 15,329(65)

D (1286)

8 D MESON (1285,JPG=) I=0

JPG DISCUSSED AT OXFORD, SEE ROSENFELD 65

8 D MESON MASS (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
U 8M			1280.0	10.0		MILLER D	65	HBC			
J 8M			1290.0	8.0		D.ANDLAU	65	HBC			

8 D MESON WIDTH (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
U 8W			40.0	10.0		MILLER D	65	HBC			
J 8W	*		25.0	APPROX.		D.ANDLAU	65	HBC			

8 D MESON PARTIAL DECAY MODES

Code	Mode	
U 8P1	D MESON INTO K KBAR PI	S10S12S 8

8 D MESON BRANCHING RATIOS

U 8R *FOR 1+ NONET SU3 RATES SEE E.G. SHEN+, UCRL 16930(66) SUBM. TO PRL

E (1418)

6 E MESON (1410,JPG=) I=0,1

6 E MESON MASS (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
J 6M		316	1415.0	15.0		ARMENTERO	64	HBC	0		6/66
U 6M			1420.0	10.		MILLER D	65	HBC			

6 E MESON WIDTH (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
U 6W		316	70.0	15.0		ARMENTERO	64	HBC	0		6/66
U 6W			60.0	10.0		MILLER D	65	HBC			

6 E MESON BRANCHING RATIOS

U 6R *FOR 1+ NONET SU3 RATES SEE E.G. SHEN+, UCRL 16930(66) SUBM. TO PRL

f′ (1500)

13 F PRIME (1500,JPG=2++) I=0

13 F PRIME(1500) MASS (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
U13M	*	32	1500.0			BARNES	65	HBC		5.0 K- P	
U13M	*	14	1480.0			CRENNELL	66	HBC		6.0 PI- P	8/66

13 F PRIME(1500) WIDTH (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
U13W	*		80.0	APPROX.		BARNES	65	HBC			

13 F PRIME PARTIAL DECAY MODES

Code	Mode	
U13P1	F PRIME INTO PI+ PI-	S08S08
U13P2	F PRIME INTO K KBAR	S12S12
U13P3	F PRIME INTO K K*(890)	S10U18

13 F PRIME BRANCHING RATIOS

Code	N	Events	Quantity	Error+	Reference	Yr	Tecn	Comments	Date
J13R1	*		F PRIME INTO (PI+ PI-)/(K KBAR + K K*(890))					(P1)/(P2+P3)	
U13R1	N	19	1.0	OR LESS	BARNES	63	HBC		
U13R1	N	SU3	.03	ESTIMATE FROM SU3	GLASHOW	63	SU3		
J13R2	*		F PRIME INTO (K KBAR) / TOTAL					(P2)/TOTAL	
U13R2			0.64	0.31	GOLDBERG	66			8/66

J13R *FOR 2+ NONET SU3 RATES SEE E.G. GLASHOW,SOCOLOW, PRL 15,329(65)

ρ (756)

9 RHO (750,JPG=1-+) I=1

9 RHO MASS (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
U 9M+		610	770.0	10.0		ALFF	62	HBC	+		
J 9M+	C		760.0	9.0		CARMONY	64	HBC	+		
U 9M+	C	CARMONY MASS CALCULATED FOR MOMENTUM TRANSFER LESS THAN 4 (MPI**2)									
U 9M+			760.	10.		ARMENISE	65	HBC	+		
J 9M+			765.0	5.0		ALFF-STEI	66	HBC	+	2-3 PI+ P	6/66
J 9M+	*		783.0	6.0		JAMES	66	HBC	+	2.1 PI+ P	6/66
U 9M+			758.0	10.0		JAMES	66	HBC		SEE NOTE J BELOW	8/66
U 9M+	J	FROM JAMES WE USE MASS CALC FOR MOMENTUM TRANSFER LESS THAN 2.5 MPI**2									
U 9M+			750.0	3.0		BALTAY	66	HBC	+-	0.0 PBARP	6/66
U 9M-			748.0			KENNEY	62	HBC	-		
U 9M-			765.0	10.0		ERWIN	63	HBC	-		
J 9M-		130	775.0			GUIRAGOSS	63	HBC	-		
U 9M-			768.0	5.0		BLIEDEN	65	MMSP	-	3-5 PI- P	6/66
U 9M-			760.0	5.0		HAGOPIAN	66	HBC	-	3.0 PI- P	6/66
U 9M0		300	750.0	10.0		ALFF	62	HBC	0		
U 9M0		190	750.0	20.0		SAMIOS	62	HBC	0		
U 9M0		300	760.0	10.0		ABOLINS	63	HBC	0		
U 9M0			763.0	10.0		ERWIN	63	HBC	0		
U 9M0		160	775.0			GUIRAGOSS	63	HBC	0		
U 9M0		500	770.0	10.0		GOLDHABER	64	HBC	0		
U 9M0	*		735.0	10.0		ALYEA	65	DBC	0	2.2 K- P	6/66
U 9M0			750.0			CLARK	65	SPRK	0		
U 9M0			763.0			DERADO	65	DBC	0	4.0 PI- P	6/66
U 9M0			750.0	15.0		GUTAY	65	HBC	0	2.0 PI- P	6/66
U 9M0			740.0	10.0		LANZEROTT	65	CNTR	0		
U 9M0			768.0	14.0		ACCENSI	66	HBC	0	5.7 PBARP	6/66
U 9M0			750.0	5.0		ALFF-STEI	66	HBC	0	2-3 PI+ P	6/66
U 9M0			749.4	3.3		BALTAY	66	HBC	0	0.0 PBARP	6/66
U 9M0			775.0	5.0		HAGOPIAN	66	HBC	0	3.0 PI- P	6/66
U 9M0			765.0	8.0		JAMES	66	HBC	0	2.1 PI+ P	6/66
U 9M		290	755.0			CHADWICK	63	HBC	+-0		
J 9M			740.0			WALKER	62	HBC	-0		
U 9M		240	752.0			ALITTI	63	HBC	-0		
U 9M			765.0			LEE	65	HBC	-0		

9 RHO WIDTH (MEV)

Code	N	Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
J 9W+		610	130.0	10.0		ALFF	62	HBC	+		
U 9W+	C		77.0	20.0		CARMONY	64	HBC	+		
U 9W+	C	CARMONY WIDTH CALCULATED FOR MOMENTUM TRANSFER LESS THAN 4 (MPI**2)									
U 9W+			90.0	10.0		SACLAY	63	HBC	+		
J 9W+			160.	10.		ARMENISE	65	HBC	+		
U 9W+			100			ALFF-STEI	66	HBC	+	2-3 PI+ P	6/6
U 9W+	*		177.0	15.0		JAMES	66	HBC	+	2.1 PI+ P	7/6
U 9W+			147.0	19.0		JAMES	66	HBC		SEE NOTE J BELOW	8/6
U 9W+	J	FROM JAMES WE USE WIDTH CALC FOR MOMENTUM TRANSFER LESS THAN 2.5 MPI**2									
U 9W+			150.0	30.0		BALTAY	66	HBC	+-	0.0 PBARP	6/6
U 9W-	*		65.0	20.0		ERWIN	63	HBC	-		
U 9W-		130	125.0			GUIRAGOSS	63	HBC	-		
U 9W-		98	180.0			BONDAR	64	HBC	-		
U 9W-			127.0	5.0		BLIEDEN	65	MMSP	-	3-5 PI- P	6/6
U 9W-			150.0	20.0		HAGOPIAN	66	HBC	-	3.0 PI- P	6/6
U 9W0		300	100.0	10.0		ALFF	62	HBC	0		
U 9W0		190	150.0	20.0		SAMIOS	62	HBC	0		
U 9W0		300	90.0	10.0		ABOLINS	63	HBC	0		
U 9W0			165.0	20.0		ERWIN	63	HBC	0		
U 9W0		160	175.0			GUIRAGOSS	63	HBC	0		
J 9W0		96	210.0			BONDAR	64	HBC	0		
U 9W0		500	130.0			GOLDHABER	64	HBC	0		
U 9W0			110.0	20.0		ALYEA	65	DBC	0	2.2 K- P	6/6
U 9W0			130.0			CLARK	65	SPRK	0		
J 9W0			150.0			DERADO	65	HBC	0	4.0 PI- P	6/6
U 9W0			80.0	15.0		GUTAY	65	HBC	0	2.0 PI- P	6/6
U 9W0			150.0	10.0		LANZEROTT	65	CNTR	0		
U 9W0			72.0	30.0		ACCENSI	66	HBC	0	5.7 PBARP	6/6
J 9W0			100			ALFF-STEI	66	HBC	0	2-3 PI+ P	6/6
U 9W0			146.0	17.0		BALTAY	66	HBC	0	0.0 PBARP	6/6
U 9W0			120.0	10.0		HAGOPIAN	66	HBC	0	3.0 PI- P	6/6
J 9W0			103.0	13.0		JAMES	66	HBC	0	2.1 PI+ P	6/6
U 9W		290	110.0			CHADWICK	63	HBC	+-0		
U 9W			120.0			WALKER	62	HBC	-0		
J 9W			125.0	15.		LEE	65	HBC	-0		
U 9W	*		170.0			WOLF	65	RVUE			6/

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CODE    EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS     DATE
    ABOVE BACKGROUND                                                         PUNCHED

      N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

                        9  RHO PARTIAL DECAY MODES

U 9P1      RHO INTO 2PI                                        S 8S 8
U 9P2      RHO INTO 4PI                                        S 8S 8S 8S 8
U 9P3      RHO INTO PI GAMMA                                   S 8S 0
U 9P4      RHO INTO E+ E-                                      S 3S 3
J 9P5        RHO INTO PI ETA                                   S 8S14
U 9P6        RHO INTO MU+ MU-                                  S 4S 4

                        9  RHO BRANCHING RATIOS

U 9R1   *  RHO INTO 4PI/2PI                                  (P2)/(P1)
U 9R1   *    0.05 OR LESS                XUONG     62 HBC
U 9R1   *        0.026 OR LESS           BLIEDEN   65 MMSP  -  3-5 PI- P       6/66
U 9R1   *        0.01 OR LESS            DEUTSCHMA 66 HBC  +   8.0 PI+ P       6/66
U 9R1   *        0.006 OR LESS           JAMES     66 HBC    +                 6/66

U 9R2   *  RHO INTO PI GAMMA/2PI                             (P3/P1)
U 9R2   *    0.02   OR LESS              DAUDIN    64 HBC  +
U 9R2   *        0.007 OR LESS           HUSON     66 HLBC                     6/66

J 9R3   *  RHO INTO(E+ E-)/(PI+PI-)     (UNITS 10**-4)        (P4)/(P1)
U 9R3            0.5       0.6       0.3   ZDANIS    65 SPRK   C               8/66

J 9R4   *    RHO INTO (PI ETA)/(2PI)                          (P5)/(P1)
J 9R4   *        0.03 OR LESS            DEUTSCHMA 66 HBC  +   8.0 PI+ P       6/66

U 9R5   *    RHO INTO (MU+ MU-)/(PI+ PI-) (UN 10**-4)         (P6)/(P1)
J 9R5            0.33      0.16      0.07  DE PAGTER 66 CNTR   0 5.2 GAM P     6/66
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$K\bar{K}_1$ (1003)

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                        16 K KBAR)1 (1025,JPG=    )  I=1

                        16 K KBAR)1 MASS  (MEV)

U16M    *      1060.0                    BELYAKOV  64 PBC                      6/66
U16M    *   50 1025.0   APPROX.          ARMENTERO 65 HBC  +-
J16M       143 1003.3      7.0+SYSTEMATIC ROSENFELD 65 RVUE +-                 8/66
J16M    *      SCAT. LENGTH 2 TO 6 FERMIS.BALTAY   66 HBC                      8/66
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                        16 K KBAR)1 WIDTH (MEV)

U16W    *        60.0                    BELYAKOV  64 PBC                      6/66
J16W    *   50   40.0   APPROX.          ARMENTERO 65 HBC  +-
J16W       143   57.0     13.0+SYSTEMATIC ROSENFELD 65 RVUE +-                 8/66
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                      U16 KKBAR)1 BRANCHING RATIOS

                  SEE NOTES ON MESONS FOLLOWING THESE LISTINGS
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REFERENCES ON MESON RESONANCES

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AUTHOR   YR JOURNAL VOL. PAGE AUTHORS                   // LABORATORIES    CODE
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f (1254)

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                                 5 F (1250,JPG=2+)I=0

SELOVE   62 PRL 9 272           SELOVE,HAGOPIAN,BRODY,BAKER,LEBOY // PENNA     U 5
BONDAR   63 PL 5 153            BONDAR+//AACHEN+BIRM+BONN+DESY+IC-LOND+MPI     U 5
VEILLET  63 PRL 10 29           VEILLET,HENNESSY,BINGHAM,BLOCH+//PAR+MILAN     U 5
LEE      64 PRL 12 342          LEE,ROE,SINCLAIR,VANDERVELDE //// MICHIGAN     U 5

CHUNG    65 PRL 15 325          CHUNG,DAHL,HARDY,HESS,JACOBS,KIRZ //// LRL     U 5
GUIRAGOS 65 PRL 11 85           Z G T GUIRAGOSSIAN ////////////////// LRL      U 5
WANGLER  65 PR  137 B 414       T P WANGLER,A R ERWIN,W WALKER //WISCONSIN     U 5
ACCENSI  66 PL  20 557          ACCENSI,ALLES-BORELLI,FRENCH,FRISK+ //CERN     U 5
DELTSCHM 66 PL  20 82           DEUTSCHMANN,STEINBERG + //AACH+BERLIN+CERN     U 5
WAHLIG   66 PR  147  941        +SHIBATA,GORDON,FRISCH,MANNELLI //MIT+PISA   J U 5

                                  QUANTUM NUMBERS NOT REFERRED TO IN DATA CARDS

HAGOPIAN 63 PRL 10 533          V HAGOPIAN,W SELOVE ///////////////// PENNA    U 5
ADERHOLZ 64 PL 10 240           AACHEN+BERLIN+BIRM+BONN+HAMBUR+IC-LOND+MPI  IJ U 5
BRUYANT  64 PL 10 232           BRUYANT,GOLDBERG,HOLDER,FLEURY,HUC/CERN+PA   I U 5
SODICKSO 64 PRL 12 485          SODICKSON,WAHLIG,MANNELLI,FRISCH+ //// MIT   I U 5
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D (1286)

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                                 8 D MESON(1285,JPG= )I=0

D'ANDLAU 65 PL 17 347           D ANDLAU,ASTIER,BARLOW +//CDF+CERN+RAD+LIV     U 8
MILLER   65 PRL 14 1074         MILLER,CHUNG,DAHL,HESS,HARDY,KIRZ+//LRL+UC     U 8
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E (1418)

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                                 6 E MESON(1410,JPG=)I=0,1

ARMENTER 64 DUBNA CONF 1 467    ARMENTEROS,EDWARDS,JACOBSEN,ASTIER+ //CERN     U 6
MILLER   65 PRL 14 1074         MILLER,CHUNG,DAHL,HESS,HARDY,KIRZ+ /LRL+UC     U 6
ROSENFEL 65 OXFORD CONF 58      A H ROSENFELD ////////////////// LRL--RVUE     U 6
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f′ (1500)

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                                 13 F PRIME (1500,JPG=2++)  I=0

BARNES   65 PRL 15 322          BARNES,CULWICK,GUIDONI,GOZ,HORWITZ+/BNL,SY     U13
GLASHOW  65 PRL 15 329          S L GLASHOW, R H SOCOLOW    //SU3 BERKELEY     U13
CRENNELL 66 PRL  16  1025       + KALBFLEISCH,LAI,SCARR,SCHUMANN +  // BNL I   U13
GOLDBERG 66  SUBMITTED TO NC    + LEITNER,MUSTO,O RAIFEARTAIGH  //SYRACUSE     U13
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ρ (756)

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                                 9 RHO(750,JPG=1-+)I=1

ANDERSON 61 PRL 6 365           ANDERSON,BANG,BURKE,CARMONY,SCHMITZ // LRL     U 9
ALFF     62 PRL 9 322           ALFF,BERLEY,COLLEY,GELFAND,BRUGGER+/CCL+RU     U 9
KENNEY   62 PR 126 736          V P KENNEY,W D SHEPHARD,C D GALL /KENTUCKY     U 9
SAMIOS   62 PRL 9 139           SAMIOS,BACHMAN,LEA+ // BNL+CCNY+COLUM+KENT     U 9
WALKER   62 CERN CONF 42        W D WALKER,E WEST A R ERWIN + // WISCONSIN     U 9
XUONG    62 PR 128 1849         NGUYEN HUU XUONG,GERALD R LYNCH ////// LRL     U 9

ABOLINS  63 PRL 11 381          ABOLINS,LANDER,MEHLHOP,NGUYEN,YAGER / UCSD     U 9
ALITTI   63 NC 29 515           ALITTI,BATON,ARMENISE+/SAC+ORSAY+BARI+BOLO     U 9
CHADWICK 63 PRL 10 62           CHADWICK,DAVIES,DERRICK,CRESTI + / OXF+PAD     U 9
GUIRAGOS 63 PRL 11 85           ZAVEN GUIRAGOSSIAN //////////////////// LRL    U 9
ERWIN    63 SIENA CONF 1 112    ERWIN,SATTERBLOM,WALKER,WEST /// WISCONSIN     U 9
SACLAY   63 SIENA CONF 1 239    SACLAY+ORSAY+BARI + BOLOGNA(COLLABORATION)     U 9

BATON    64 NC 35 713           BATON,BERTHELOT,ALLES,BOFELLI + /CEN+BOLOG     U 9
BONDAR   64 NC 31 729           BONDAR+//AACHEN+BIRM+BONN+DESY+IMP-COL+MPI     U 9
CARMONY  64 DUBNA CONF 1 486    CARMONY,HOA,LANDER,NG H XUONG,YAGER //UCSD     U 9
DAUDIN   64 REPORT CEA-R-2525   DAUDIN,JABIOL,MONGELLI + ///// SACLAY+BARI     U 9
GOLDHABE 64 PRL 12 336          GOLDHABER,BROWN,KADYK,SHEN,TRILLING/LRL+UC     U 9

ALYEA    65 PL 15 82            ALYEA,CRITTENDEN,MARTIN,RHODE + // INDIANA     U 9
ARMENISE 65 NC 37 361           SACLAY+ORSAY+BARI+BOLOGNA (COLLABORATION )     U 9
BLIEDEN  65 PL 19 444           BLIEDEN,FREYTAG,GEIBEL,HASSAN + ///// CERN     U 9
CLARK    65 PR 139 B 1556       A CLARK,CHRISTENSON,CRONIN,TURLAY/PRINCETO     U 9
DERADO   65 PRL 14 872          DERADO,KENNEY,POIRIER,SHEPHARD//NOTRE DAME     U 9
GUTAY    65 NC 39 381           GUTAY,LANNUTTI,TULI /////////////// FLORIDA    U 9
LANZEROT 65 PRL 15 210          LANZEROTTI,BLUMENTHAL,EHN,FAISSLER +/HARVD     U 9
LEE      65 MICH 04938          YONG-YUNG LEE ///////////////////// MICHIGAN   U 9
WOLF     65 PL 19 328           G WOLF ///////////////////////////////  DESY   U 9
ZDANIS   65 PRL 14 721          ZDANIS,MADANSKY,KRAEMER + //////// JHU+BNL     U 9

ACCENSI  66 PL 20 557           ACCENSI,ALLES-BORELLI,FRENCH,FRISK+// CERN     U 9
ALFF-STE 66 PR 145 1072         ALFF-STEINBERGER,BERLEY,BRUGGER+//CCL+RUTG     U 9
BALTAY   66 NEVIS 142           BALTAY,FRANZINI,LUTJENS,ZANELLO+//COLUMBIA     U 9
DE PAGTE 66 PRL 16 35           DE PAGTER+//CAM EL ACC+MIT+NORTHEAST+ SLAC     U 9
DEUTSCHM 66 PL 20 82            DEUTSCHMANN,STEINBERG +//AACH+BERLIN+ CERN     U 9
HAGOPIAN 66 PR 145 1128         HAGOPIAN,SELOVE,ALITTI,BATON+//PENN+SACLAY     U 9
HUSON    66 PL 20 91            HUSON,ALLARD,DRIJARD,HENNESSY + //ORSAY+EP     U 9
JAMES    66 PR 142 896          F E JAMES,KRAYBILL /////// YALE+BROOKHAVEN     U 9

            EVIDENCE FOR STRUCTURE WITHIN THE RHO PEAK IS OBSERVED BY

KEEFE    64 DUBNA CONF  1 461 KEEFE,KERTH,NOBLE,THRESHER,WENZEL,ZIPF/LRL       U 9
JONES    64 DUBNA CONF  1 457 L W JONES+ //// MICH+CERN+PRIN+PURDUE+DESY       U 9

     SEE ALSO
BUTTON   62 PR 126 1858         BUTTON,KALBFLEISCH,LYNCH,MAGLIC +// LRL+UC     U 9
CALDWELL 62 PL 2 253            CALDWELL,BLEULER,ELSNER,JONES,ZACHAROV/CER     U 9
FOELSCHE 62 CERN CONF 36        FOELSCHE,FOWLER,KRAYBILL,SANFORD+/YALE+BNL     U 9

                                  QUANTUM NUMBERS NOT REFERRED TO IN DATA CARDS

ERWIN    61 PRL 6 628           A R ERWIN,R MARCH,W WALKER,E WEST//BNL+WIS  IJ U 9
PICKUP   61 PRL 7 192           E PICKUP,D ROBINSON,E SALANT ////////// BNL  J U 9
STONEHIL 61 PRL 6 624           STONEHILL,BALTAY,COURANT,FOWLER+//YALE+BNL  IJ U 9
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$K\bar{K}_1$ (1003)

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                                 16 K KBAR)1 (1025,JPG=    )  I=1

BELYAKOV 64 JINR P-1586         BELYAKOV,VIRYASOV,KLADNITSKAYA + /// DUBNA     U16
ARMENTER 65 PL 17 344           ARMENTEROS,EDWARDS,JACOBSEN +///CERN+PARIS     U16
ASTIER   65 OXFORD ABS.143 AND SUPPL. P 13                 CERN+COLL DE FR.    U16
BARASH   65 PR  139 B  1659     +FRANZINI,KIRSCH,MILLER,STEINBERGER+/COLUM     U16
ROSENFEL 65 OXFORD CONF 58      A H ROSENFELD ////////////////// LRL--RVUE     U16
BALTAY   66 PR  142 B  932      +LACH,SANDWEISS,TAFT,YEH,STONEHILL+ //YALE     U16
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DATA ON MESON RESONANCES

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CODE     EVENTS QUANTIIY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS     DATE
     ABOVE BACKGROUND                                                          PUNCHED

      N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS
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A₁ (1080)

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                      10  A1 MESON ([redacted],JPG=  -) I=1
                                   1080
                      10  A1 MESON  MASS (MEV)

U10M          1080.0    20.0            ALLARD    64 FBC  -
U10M          1080.0    10.0            HESS      64 HBC  -
U10M          1080.0                    ADERHOLZ  64 HBC
J10M          1080.0                    DEUTSCHMA 66 HBC  +   8.0 PI+ P        6/66
--------------------------------------------------------------------------------

                      10  A1 MESON  WIDTH (MEV)

U10W   *       100.0   APPROX           HESS      64 HBC  -
U10W   *       150.0   APPROX           ALLARD    64 FBC  -
J10W            80.0                    ADERHOLZ  64 HBC
--------------------------------------------------------------------------------

                      10  A1 PARTIAL DECAY MODES

U10P1     A1 INTO RHO PI                                      U 9S 8
U10P2     A1 INTU KBAR K                                      S10S11
U10P3      A1 INTO ETA PI                                     S14S 8
U10P4      A1 INTO ETA PRIME PI                               U 2S 8
--------------------------------------------------------------------------------

                      10  A1 BRANCHING RATIOS

U10R1  *   A1 INTC (KBAR K)/(RHO PI)                         (P2)/(P1)
U10R1  *        0.05  OR LESS           CHUNG     64 HBC
U10R1  *        0.01 OR LESS            DEUTSCHMA 66 HBC  +                    6/66

J10R2  *    A1 INTO (ETA PI)/(RHO PI)                        (P3)/(P1)
U10R2  *        0.015 OR LESS           DEUTSCHMA 66 HBC  +                    6/66

U10R3  *    A1 INTO (ETA PRIME PI)/(RHO PI)                  (P4)/(P1)
J10R3  *        0.015 OR LESS           DEUTSCHMA 66 HBC  +                    6/66

U10R   *FOR 1+ NCNET SU3 RATES SEE E.G. SHEN+, UCRL 1693C(66) SUBM. TO PRL
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B (1220)

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                      11  B MESON (1220,JPG=  +) I=1

U11    *  FOR EVIDENCE THAT THE B IS JUST DECK EFFECT, SEE CHUNG 66

                      11  B MESON  MASS (MEV)

U11M       60 1220.0                    ABOLINS   63 HBC  +
U11M          1220.0                    HESS      64 HBC   -
J11M          1220.0                    GOLDHABER 65 HBC
--------------------------------------------------------------------------------

                      11  B MESON  WIDTH (MEV)

U11W       60  100.0    20.0            ABOLINS   63 HBC  +
U11W           180.0    30.0            HESS      64 HBC   -
J11W            80.0                    GOLDHABER 65 HBC
--------------------------------------------------------------------------------

                      11  B MESON PARTIAL DECAY MODES

U11P1     B MESON INTO OMEGA+PI                               U 1S 8
U11P2     B MESCN INTO 2PI+ 2PI-                              S 8S 8S 8S 8
U11P3     B MESON INTO K KBAR                                 S10S10
U11P4     B MESCN INTO PI PI                                  S 8S 8
--------------------------------------------------------------------------------

                      11  B MESON  BRANCHING RATIOS

J11R1  *  B INTO  4PI/(OMEGA PI)                             (P2)/(P1)
U11R1  *        0.5    OR LESS          ABOLINS   63 HBC  +

U11R2  *  B MESON INTO (K KBAR)/(OMEGA PI)                   (P3)/(P1)
J11R2  *        0.10  OR LESS           HESS      64 HBC

U11R3  *      B MESCN INTO (PI PI)/(PI OMEGA)                 (P4)/(P1)
J11R3  *        0.3   OR LESS           ADERHOLZ  64 HBC                       7/66
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A₂ (1310)

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                      12  A2 MESON (1310,JPG=2+-)  I=1

                      12  A2 MESON  MASS (MEV)

U12M          1320.0                    ADERHOLZ  64 HBC
U12M       70 1310.0                    CHUNG     64 HBC  -
U12M          1335.0    10.0            GOLDHABER 64 HBC  +-  3.7 PI+- P
J12M          1285.0                    ARMENTERO 65 HBC      K1K1 DECAY       6/66
U12M          1270.0                    DERADO    65 HBC                       6/66
U12M     1425 1290.0     5.0            LEFEBVRES 65 MMSP -                    6/66
U12M          1300.0                    SEIDLITZ  65 DBC  -                    6/66
J12M          1290.0    10.0            BARNES    66 HBC  -                    6/66
U12M          1280.0                    DEUTSCHMA 66 HBC  +   8.0 PI+ P        6/66
U12M          1310.0    10.0            BENSON    66 DBC                       6/66
--------------------------------------------------------------------------------

                      12  A2 MESON  WIDTH (MEV)

U12W           100.0                    ADERHOLZ  64 HBC
U12W       70   80.0                    CHUNG     64 HBC  -
U12W            90.0    10.0            GOLDHABER 64 HBC  +-  3.7 PI+- P
U12W           150.0                    DERADO    65 HBC                       6/66
U12W     1425   99.0    15.0            LEFEBVRES 65 MMSP -                    6/66
U12W           140.0                    SEIDLITZ  65 DBC  -                    6/66
U12W            70.0    10.0            BARNES    66 HBC  -                    6/66
U12W           110.0    45.0            BENSON    66 DBC                       6/66
--------------------------------------------------------------------------------

                      12  A2 MESON PARTIAL DECAY MODES

U12P1     A2 MESCN INTO RHO PI                                U 9S 8
U12P2     A2 MESON INTO KBAR K                                S10S12
U12P3     A2 MESON INTO ETA PI                                S14S 8
U12P4     A2 MESON INTO ETA PRIME PI                          U 2S 8
U12P5     A2 MESCN INTO PI+ PI- PIO                           S 8S 8S 9
--------------------------------------------------------------------------------

                      12  A2 MESON  BRANCHING RATIOS

J12R1  *  A2 MESON  INTO (K KBAR) / (RHO PI)                 (P2)/(P1)
U12R1  *        0.04  OR LESS           ARMENTERO 65 HBC  -

U12R1           0.03     0.02           DEUTSCHMA 66 HBC  +                    6/66

U12R2  *  A2 MESON INTO (ETA PI)/TOTAL                       (P3)/TOTAL
U12R2           0.03     0.03           CHUNG     65 HBC  -
U12R2  *        0.03 OR LESS            DEUTSCHMA 66 HBC  +                    6/66

U12R7  *  A2 MESON INTO (ETA PI) / (RHO PI)                  (P3)/(P1)
U12R7           0.3      0.2            ADERHOLZ  65 HBC

U12R3  *  A2 MESON INTO (RHO PI)/TOTAL                       (P1)/TOTAL
U12R3           0.91     0.04     0.10  CHUNG     65 HBC  -

U12R4  *  A2 MESON INTO (ETA PRIME PI) / TOTAL               (P4)/TOTAL
U12R4  *        0.1   OR LESS           CHUNG     65 HBC  -
U12R4  *        0.015 OR LESS           DEUTSCHMA 66 HBC  +                    6/66

U12R5  *  A2 MESON INTO (KBAR K)/TOTAL                       (P2)/TOTAL
U12R5           0.055    0.015          CHUNG     65 HBC  -

U12R6  *  A2 MESCN INTO (PI+ PI- PIO) / (RHO PI)             (P5)/(P1)
U12R6  *        0.17  OR LESS           BENSON    66 DBC   0

U12R   *FOR 2+ NONET SU3 RATES SEE E.G. GLASHOW,SOCOLOW, PRL 15,329(65)
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πππ (1630)

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                      34   3 PI (1630,JPG=   )  I=1

               EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

                      34   3 PI (1630) MASS  (MEV)

U34M       20 1630.0    30.0            VETLITSKY 66 HBC  -  4.7 K- P          6/66
--------------------------------------------------------------------------------

                      34  3 PI (1630) WIDTH  (MEV)

U34W       20  100.                     VETLITSKY 66 HBC  -                    6/66
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ππ (1670)

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                      15  PI PI (1670, JPG=   )  I =

               EVIDENCE NOT YET CUMPELLING,OMITTED FROM TABLE

U15    *  FCR CCMPILATIONS AND NEGATIVE EVIDENCE, SEE ROSENFELD 65,CXFORD RVUE  8/66

                      15  PI PI (1670)  MASS (MEV)

U15M          1700.0   100.0            BELLINI   65 HLBC  0                   6/66
U15M          1620.0    20.0            DEUTSCHMA 65 HBC  +                    6/66
U15M          1670.0                    FORINO    65 DBC   0                   6/66
J15M          1670.0    30.0            GOLDBERG  65 HBC   0

U15M          1675.0    15.0            SEGUINOT  66 MMS  -                    6/66
--------------------------------------------------------------------------------

                      15  PI PI (1670)  WIDTH (MEV)

J15W       13   80.0    40.0            DEUTSCHMA 65 HBC  +                    6/66
U15W            40.0                    FORINO    65 DBC   0                   6/66
U15W           180.0    40.0            GOLDBERG  65 HBC   C
U15W            66.0    10.0            SEGUINOT  66 MMS  -                    6/66
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CODE EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR TECN SIGN COMMENTS DATE ABOVE BACKGROUND PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

S (1930)

31 S(1930, JP= , I GTE 1) 3 CHARGED DECAY TRACKS

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

31 S (1930) MASS (MEV)

CODE	EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	DATE
U31M		1929.0	14.0		CHIKOVANI	66	MMSP	-	8/66
U31M	15	1910.0	20.0		DEUTSCHMA	65	HBC	+	6/66

31 S (1930) WIDTH (MEV)

CODE	EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	DATE
U31W		35.0	OR LESS		CHIKOVANI	66	MMSP	-	8/66
U31W	15	90.0	40.0		DEUTSCHMA	65	HBC	+	6/66

T (2200)

32 T(2200, JP= , I GTE 1) 3 CHARGED DECAY TRACKS

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

32 T(2200) MASS (MEV)

CODE	EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	DATE
U32M		2195.0	15.0		CHIKOVANI	66	MMSP	-	8/66

32 T(2200) WIDTH (MEV)

CODE	EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	DATE
U32W *		13.0	OR LESS		CHIKOVANI	66	MMSP	-	8/66

U (2390)

33 U(2390, JP= , I GTE 1) 1,3,5, CHARGED TRACKS

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

33 U(2390) MASS (MEV)

CODE	EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	DATE
U33M		2382.0	24.0		CHIKOVANI	66	MMSP	-	8/66

33 U(2390) WIDTH (MEV)

CODE	EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	DATE
U33W *		30.0	OR LESS		CHIKOVANI	66	MMSP	-	8/66

REFERENCES ON MESON RESONANCES

AUTHOR YR JOURNAL VOL. PAGE AUTHORS // LABORATORIES CODE

A_1 (1080)

1C A1 MESON(1080 [redacted],JPG= -) I=1

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
BELLINI	63 NC 29 896	BELLINI,FIORINI,HERZ,NEGRI,RATTI /// MILAN		U10
ADERHOLZ	64 PL 10 226	AACH+BERL+BIRM+BONN+DESY+HAMB+IMP.COL+ MPI		U10
ALLARD	64 PL 12 143	ALLARD+ // PARIS+CERN+MILAN+CEA-SAC+UC-BKY		U10
CHUNG	64 PRL 12 621	CHUNG,DAHL,HARDY,HESS,KALBFLEISCH + // LRL		U10
GOLDHABE	64 PRL 12 336	GOLDHABER,BROWN,KADYK,SHEN,TRILLING/LRL+UC		U10
HESS	64 DUBNA CONF 1 422	HESS,CHUNG,DAHL,HARDY,KIRZ,MILLER //// LRL		U10
LANDER	64 PRL 13 346 A	LANDER,ABOLINS,CARMONY,HENDRICKS +/// UCSD	JP	U10
ALITTI	65 PL 15 69	ALITTI,BATON,DELER,CRUSSARD+//CERN+SAC+ECL		U10
DEUTSCHM	66 PL 20 82	DEUTSCHMANN,STEINBERG + //AACH+BERLIN+CERN		U10

B (1220)

11 B MESON(1220,JPG= +)I=1

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
ABOLINS	63 PRL 11 381	ABOLINS,LANDER,MEHLHOP,XUONG,YAGER // UCSD		U11
BONDAR	63 PL 5 209	BONDAR,DODD+//AACHEN+BIRM+HAMB+IC-LOND+MPI		U11
CHUNG	63 SIENA CONF 1 201	CHUNG,DAHL,HESS,KALBFLEISCH,KIRZ + /// LRL		U11
ADERHOLZ	64 PL 10 240	AACHEN+BERLIN+BIRM+BONN+HAMBUR+IC-LOND+MPI		U11
HESS	64 DUBNA CONF 1 422	HESS,CHUNG,DAHL,HARDY,KIRZ,MILLER //// LRL		U11
GOLDHABE	65 PRL 15 118	G GOLDHABER,S GOLDHABER,KADYK,SHEN /// LRL		U11

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
CARMONY	64 PRL 12 254	CARMONY,LANDER,RINDFLEISCH,XUONG,YAGER//UC	JP	U11

A_2 (1310)

12 A2 MESON(1310,JPG=2+-)I=1

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
ADERHOLZ	64 PL 10 248	AACHEN+BERLIN+BIRM+BONN+HAMB+IC-LONDON+MPI		U12
CHUNG	64 PRL 12 621	CHUNG,DAHL,HARDY,HESS,KALBFLEISCH+ /// LRL		U12
GOLDHABE	64 DUBNA CONF 1 480	G GOLDHABER,S GOLDHABER,O'HALLORAN,SHEN/LRL		U12
HESS	64 DUBNA CONF 1 422	HESS,CHUNG,DAHL,HARDY,KIRZ,MILLER //// LRL		U12
CHUNG	66 PRL 16 481	S CHUNG,NEVEU-RENE,DAHL,KIRZ,MILLER+ //LRL		U11
ARMENTER	65 PL 17 344	ARMENTEROS,EDWARDS,JACOBSEN + //CERN+CDEF		U12
CHUNG	65 PRL 15 325	CHUNG,DAHL,HARDY,JACOBS,KIRZ,MILLER+ //LRL		U12
DERADO	65 PRL 14 872	DERADO,KENNEY,POIRIER,SHEPHARD//NOTRE DAME		U12
LEFEBVRE	65 PL 19 434	LEFEBVRES,LEVRAT,BLIEDEN,DUBAL + //CERN		U12
SEIDLITZ	65 PRL 15 217	L SEIDLITZ,O I DAHL,D H MILLER /////// LRL		U12
BARNES	66 PRL 16 41	BARNES,FOWLER,LAI,ORENSTEIN + /// BNL+CCNY		U12
BENSON	66 PRL 16 1177	G BENSON,LOVELL,MARQUIT,ROES + // MICHIGAN		U12
DEUTSCHM	66 PL 20 82	DEUTSCHMANN,STEINBERG + //AACH+BERLIN+CERN		U12

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
LANDER	64 PRL 13 346 A	LANDER,ABOLINS,CARMONY,HENDRICKS +/// UCSD	JP	U12
ADERHOLZ	65 PR 138 B 897	AACHEN+BERLIN+BIRM+BONN+HAMB+LOND+MUENCHEN		U12

FOR QUANTUM NUMBERS OF NEUTRAL A2, SEE BENSON ABOVE

$\pi\pi\pi$ (1630)

34 3 PI (1630,JPG=) I=1

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
VETLITSK	66 PL 21 579	VETLITSKY,GUSZAVIN,KLIGER,ZOLGANOV+ //ITEP		S34

$\pi\pi$ (1670)

15 PI PI (1670, JPG=) I =

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
BELLINI	65 NC 40 A 948	BELLINI,DI CORATO,DUIMINO,FIORINI //MILANO		U15
DEUTSCHM	65 PL 18 351	DEUTSCHMANN,SCHULTE + //// AACH+ZEUTH+CERN		U15
FORINO	65 PL 19 65	FORINO,GESSAROLI + //BOLOGNA+ORSAY+SACLAY		U15
GOLDBERG	65 PL 17 354	GOLDBERG+/CERN+PARIS+ORSAY+MILANO+CEA-SACL		U15
SEGUINOT	66 PL 19 712	SEGUINOT,MARTIN,MAGLIC,LEVRAT,DUBAL+//CERN		U15

S (1930)

31 S(1930, JP= , I GTE 1) 3 CHARGED DECAY TRACKS

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
CHIKOVAN	66 PL 22 233	+DUBAL,FOCACCI,KIENZLE,LEVRAT,MAGLI+/CERN+		U31

T (2200)

32 T(2200, JP= , I GTE 1) 3 CHARGED DECAY TRACKS

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
CHIKOVAN	66 PL 22 233	+DUBAL,FOCACCI,KIENZLE,LEVRAT,MAGLI+/CERN+		U32

U (2390)

33 U(2390, JP= , I GTE 1) 1,3,5, CHARGED TRACKS

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
CHIKOVAN	66 PL 22 233	+DUBAL,FOCACCI,KIENZLE,LEVRAT,MAGLI+/CERN+		U33

DATA ON MESON RESONANCES

CODE EVENTS QUANTITY ERROR+ ERRCR- REFERENCE YR TECN SIGN COMMENTS DATE
AEOVE BACKGROUND PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNCRED BY AVERAGING PROGRAMS

κ (725)

17 KAPPA (725,J =) I=1/2

U17 *MANY LATER EXPERIMENTS FAIL TO CONFIRM. NOTE FOLLOWS THIS LISTING 8/66

17 KAPPA MASS (MEV)

Code		Events	Quantity	Error+	Reference	Yr	Tecn	Sign	Date
U17M			730.0		ALEXANDER	62	HBC	+ 0	
U17M		92	726.0	3.0	MILLER	63	HBC	+ C	
U17M		33	723.0	3.0	WOJCICKI	63	HBC	-	
J17M			725.0		CONNOLLY	63	HBC		
U17M			725.0	5.0	FERRO-LUZ	64	HBC	+ 0	
U17M			735.0	5.0	KIM	65	SPRK		6/66
U17M	*		730.0	APPROXIMATELY	LONDON	66	HBC		6/66

17 KAPPA WIDTH (MEV)

Code		Events	Quantity	Error+	Reference	Yr	Tecn	Sign	Date
U17W	*	92	20.0	OR LESS	MILLER	63	HBC	+ 0	
U17W	*	33	12.0	OR LESS	WOJCICKI	63	HBC	-	
U17W	*		30.0	OR LESS	FERRO-LUZ	64	HBC	+ 0	
J17W	*		20.0	OR LESS	KIM	65	SPRK		6/66
U17W	*		15.0	OR LESS	LONDON	66	HBC		6/66

17 KAPPA PARTIAL DECAY MODES

U17P1	KAPPA INTO K PI	S10S 8

K*(892)

18 K* (890,JP =1-) I=1/2

18 K* (890) MASS (MEV)

Code	Events	Quantity	Error+	Reference	Yr	Tecn	Sign	Date
U18M		898.0	5.0	CHADWICK	63	HBC	+	
U18M		891.0	3.0	FERRO-LUZ	65	HBC	+	
J18M		890.5		ARMENTERO	65	HBC	+-	
U18M	3870	891.0	1.0	WOJCICKI	63	HBC	-	
J18M		891.0	3.0	GELSEMA	64	HBC	-	
U18M	200	880.0		ALEXANDER	62	HBC	+ 0	
U18M		895.0	2.0	FERROLUZZ	65	HBC	+ 0	6/66
U18M		895.0		WANGLER	65	HBC	+ 0	6/66
U18M		885.0		ARMENTERO	62	HBC	+-C	
U18M	70	897.0	10.0	COLLEY	62	HBC	0	
U18M	200	892.0	2.0	KRAEMER	63	HBC	0	
U18M	150	885.0		SMITH	63	HBC	C	

18 K* (890) WIDTH (MEV)

Code	Events	Quantity	Error+	Reference	Yr	Tecn	Sign	Date
J18W		46.0	8.0	CHADWICK	63	HBC	+	
U18W		47.0	4.0	FERRO-LUZ	65	HBC	+	
U18W	3870	46.0	3.0	WOJCICKI	63	HBC	-	
J18W		50.0	13.0	GELSEMA	64	HBC	-	
U18W		31.0		ARMENTERO	65	HBC	+-	
J18W	200	60.0	5.0	ALEXANDER	62	HBC	+ 0	
U18W		51.8	3.5	FERROLUZZ	65	HBC	+ C	6/66
U18W		40.0		WANGLER	65	HBC	+ 0	6/66
J18W		55.0		ARMENTERO	62	HBC	+-0	
U18W	70	60.0	10.0	COLLEY	62	HBC	0	
J18W	200	50.0	5.0	KRAEMER	63	HBC	0	
U18W	150	50.0		SMITH	63	HBC	0	

18 K* (890) PARTIAL DECAY MODES

U18P1	K* INTO K PI	S10S 8
U18P2	K*(890) INTU (K PI PI)	S10S 8S 8
U18P3	K* INTO KAPPA PI	U17S 8

18 K* (890) BRANCHING RATIOS

Code		Events	Quantity	Error	Reference	Yr	Tecn	Sign	Comments
U18R1	*	K* (890) INTO (KAPPA PI)/(K PI)							(P3)/(P1)
U18R1	*	3	0.005	OR LESS	GOLDHABER	63	HBC	-	
U18R1	*	0	0.002	OR LESS	WOJCICKI+	63	HBC	-	
U18R1	*		0.01	OR LESS	FERRO-LUZ	64	HBC	+ 0	
J18R2	*	K*(890) INTO (K PI PI)/(K PI)							(P2)/(P1)
U18R2	*	0	0.002	OR LESS	WOJCICKI+	63	HBC	-	

K_c (1215)

20 KC MESON (1215,JP=) I=1/2

20 KC MASS (MEV)

Code	Quantity	Error+	Reference	Yr	Tecn
J20M	1215.0	15.0	ARMENTERO	64	HBC

20 KC WIDTH (MEV)

Code	Quantity	Error+	Reference	Yr	Tecn
U20W	60.0	10.0	ARMENTERO	64	HBC

20 KC PARTIAL DECAY MODES

U20P1	KC INTO K RHO	S10U 9
U20P2	KC INTO K* PI	U18S 8
U20P3	KC INTC K PI PI	S11S 8S 8

20 KC BRANCHING RATIOS

Code		Quantity	Error+	Reference	Yr	Tecn	Comments	Date
J20R1	*	KC INTO (K RHO)/TOTAL		(UNITS OF 10**-2)			(P1)/TOTAL	
U20R1		75.0	10.0	ARMENTERO	64	HBC		6/66
U20R2	*	KC INTO (K* PI)/TOTAL		(UNITS OF 10**-2)			(P2)/TOTAL	
J20R2		25.0	10.0	ARMENTERO	64	HBC		6/66

Kππ (1320)

21 K2PI (1320,JPG=) I=1/2

J21 *THIS BUMP PARTLY DECK EFFECT BUT BISHOP+,SHEN+ SEE EVID. FOR RESCNANCE

21 K2PI(1320) MASS (MEV)

Code	Events	Quantity	Error+	Reference	Yr	Tecn	Sign	Comments	Date
J21M	12	1320.0		ALMEIDA	65	HBC	+	3-5 K+ P	8/66
U21M	50	1320.0		DE BAERE	65	HBC	+	3-5 K+ P	8/66
U21M	20	1305.0	10.0	BISHOP	66	HBC	+ C	2.6 K+ P	8/66
J21M	40	1310.0		BISHOP	66	HBC		K PI MODE-SURPRISE	8/66
J21M	70	1320.0	10.0	SHEN	66	HBC	+	4.6 K+ P	8/66

21 K2PI(1320) WIDTH (MEV)

Code	Events	Quantity	Error+	Reference	Yr	Tecn	Sign	Date
U21W	12	60.0		ALMEIDA	65	HBC	+	8/66
J21W	60	40.0	15.0	BISHOP	66	HBC	+	8/66
J21W	70	80.0	20.0	SHEN	66	HBC	+	8/66

21 K2PI(1320) PARTIAL DECAY MODES

J21P1	K2PI INTO K*(890) PI	U18S08
U21P2	K2PI INTO K RHO	S11U09
U21P3	K2PI INTO K OMEGA	S11U01
J21P4	K2PI INTO K PI	S10S 8
U21P5	K2PI INTO K ETA	S10S14

U21 K2PI(1320) BRANCHING RATIOS

Code		Events	Quantity	Error+	Reference	Yr	Tecn	Sign	Comments	Date
J21R1	*	K2PI INTO K*(890) PI AND K RHO (OVERLAPPING BANDS)								
J21R1		70	1.0		SHEN	66	HBC	+		8/66
U21R2	*	K2PI INTO(K OMEGA)/(K*(890) PI)							(P3)/(P1)	
J21R2	*		0.15	OR LESS	SHEN	66	HBC			8/66
U21R3	*	K2PI(1320) INTO (K*(890) PI) / TOTAL							(P1)/TOTAL	
U21R3			0.24	0.09	BISHOP	66	HBC			6/66
J21R4	*	K2PI(1320) INTO (K PI) / TOTAL							(P4)/TOTAL	
U21R4			0.68	0.12	BISHOP	66	HBC			6/66
J21R5	*	K2PI(1320) INTO (K RHO) / TOTAL							(P2)/TOTAL	
J21R5			0.06	0.06	BISHOP	66	HBC			6/66
U21R6	*	K2PI(1320) INTO (K ETA) / TOTAL							(P5)/TOTAL	
J21R6			0	0.030	BISHOP	66	HBC			6/66
U21R7	*	K2PI(1320) INTO (K OMEGA) / TOTAL							(P5)/TOTAL	
U21R7			0.020	0.020	BISHOP	66	HBC			6/66

J21R *FOR 1+ NONET SU3 RATES SEE E.G. SHEN+, UCRL 1693C(66) SUBM. TO PRL

K*(1400)

22 K* (1400,JP=) I=1/2

22 K*(14CC) MASS (MEV)

Code	Events	Quantity	Error+	Reference	Yr	Tecn	Comments	Date
U22M		14CC.C	2C.C	BADIER	65	HBC		6/66
U22M		14C4.C	15.C	FCCARDI	65	HBC		
U22M	21	140C.C	1C.C	HACUE	65	HBC		
U22M	36	143C.C	20.C	HARDY	65	HBC		
U22M	4C	144C.C		BARTSCH	66	HBC		8/66
U22M		1425.C	1C.C	BISHCP	66	HBC		6/66
U22M		143C.C	2C.C	SHEN	66	HBC	4.6 K+ P	8/66

22 K*(14CC) WIDTH (MEV)

Code	Events	Quantity	Error+	Reference	Yr	Tecn	Comments	Date
U22W		105.C	3C.C	BADIER	65	HBC		6/66
U22W		92.C	14.C	FCCARDI	65	HBC		
U22W	21	160.C		HACUE	65	HBC		
U22W	36	1CC.C	2C.C	HARDY	65	HBC		
U22W		96.C	1C.C	BISHCP	66	HBC		6/66
U22W		75.C	25.C	SHEN	66	HBC	4.6 K+ P	8/66

22 K* (14CC) PARTIAL DECAY MCDES

U22P1	K*(14CC) INTC K PI	S10S 8
U22P2	K*(14CC) INTC K*(89C) PI	U18S 8
U22P3	K*(14CC) INTO K RHC	S10U 9
U22P4	K*(1400) INTC K OMEGA	S10U 1
U22P5	K*(14CC) INTO K ETA	S10S14

U22 K*(14CC) BRANCHING RATICS

Code		Events	Quantity	Error+	Error-	Reference	Yr	Tecn	Sign	Comments	Date
U22R1	*	K*(1400) INTC (K PI)/TCTAL								(P1)/TCTAL	
U22R1			C.37	C.19		BADIER	65	HBC			6/66
U22R1			C.33	C.C7		BISHCP	66	HBC			6/66
U22R2	*	K*(140C) INTO (K*(89C) PI) / TCTAL								(P2)/TCTAL	
U22R2			0.41	C.14		BADIER	65	HBC			6/66
U22R2			C.56	C.1C		BISHCP	66	HBC			6/66
U22R3	*	K*(140C) INTO (K RHC)/TCTAL								(P3)/TCTAL	
U22R3			0.14	C.C5		BADIER	65	HBC			6/66
U22R3			C.1C	C.C5		BISHCP	66	HBC			6/66
U22R4	*	K*(1400) INTO (K CMEGA)/TCTAL								(P4)/TCTAL	
U22R4			0.C7	C.C4		BADIER	65	HBC			6/66
U22R4			C.CC7	C.CC8		BISHCP	66	HBC			6/66
U22R5	*	K*(14C0) INTC (K ETA)/TCTAL								(P5)/TCTAL	
U22R5			0.02	C.02		BADIER	65	HBC			6/66
U22R5			0.C17	C.C2C		BISHCP	66	HBC			6/66
U22R6	*	K*(1400) INTC (K*(89C) PI) / (K PI)								(P2)/(P1)	
U22R6		6	0.33	C.33		CHUNG	65	HBC	+ 0	3.9-4.2 PI- P	8/66
U22R6			C.64	C.2C		SHEN	66	HBC			8/66
U22R7	*	K*(1400) INTC (K CMEGA) / TCTAL								(P4)/(P1)	
U22R7			0.C5	0.C3	0.C5	SHEN	66	HBC			8/66
U22R8	*	K*(14CC) INTO (K RHO) / (K PI)								(P3)/(P1)	
U22R8	*		0.C9	CR LESS		CHUNG	65	HBC	+ 0	3.9-4.2 PI- P	8/66

U22R *FOR 2+ NONET SU3 RATES SEE E.G. GLASHCW,SCCCLCW, PRL 15,329(65)

CODE EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN COMMENTS DATE
ABOVE BACKGROUND PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

Kππ (1800)

U23 K2PI (1800, JP=) I = 1/2
NAMED L BY BARTSCH ET AL.

U23 K2PI (1800) MASS (MEV)

J23M	80	1789.0	10.0		BARTSCH	66 HBC	- 10.0	K- P	8/66
U23M	35	1852.0	8.0		DUBAL	66 MMSP	- 12.0	K- P	8/66

U23 K2PI (1800) WIDTH (MEV)

J23W		80.0	20.0	40.0	BARTSCH	66 HBC	8/66
J23W		84.0	14.0		DUBAL	66 MMSP	8/66

U23 K2PI (1800) PARTIAL DECAY MODES

U23P1	K2PI INTO K PI	S11S 9
J23P2	K2PI INTO K RHO	S11U 9
U23P3	K2PI INTO K*(890) PI	S 9U18
U23P4	K2PI INTO K OMEGA	S11U 1
U23P5	K2PI INTO K PI PI	S11S 9S 9

U23 K2PI (1800) BRANCHING RATIOS

U23R1 * K2PI INTO (K PI)/TOTAL BARTSCH+ SEE NONE(LESS THAN .05). 8/66

U23R2 * K2PI INTO (K RHO)/TOTAL

U23R3 * K2PI INTO (K*(890) PI)/TOTAL

J23R4 * K2PI INTO (K OMEGA)/TOTAL BARTSCH+ PROBABLY SEE THIS MODE 8/66

U23R5 * K2PI INTO 1 CHARGED/(3 CH.+ 5 CH.) DUBAL 66 GIVE ABOUT 0.4. 8/66

$K^*_{3/2}$ (1175)

24 K* 3/2 (1175,JP=) I = 3/2 ?

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE
U24 *FOR COMPILATIONS + NEG. EVID. SEE ROSENFELD,OXFORD 65 SUPPL.
J24 *BISHOP 66 SEES SLIGHT EVIDENCE FOR I = 3/2

24 K* 3/2 (1175) MASS (MEV)

U24M	*	23	1175.0		WANGLER	64 HBC			
J24M	*	15	1160.0	10.0	MILLER	65 HBC		PURDUE	
U24M	*		1180.0		BISHOP	66 HBC	SUGGEST I=3/2		6/66

24 K* 3/2 (1175) WIDTH (MEV)

U24W	*	23	25.0 OR LESS		WANGLER	64 HBC		
U24W	*	15	35.0	10.0	MILLER	65 HBC	PURDUE	
U24W	*		50.0		BISHOP	66 HBC		6/66

$K^*_{3/2}$ (1270)

25 K* 3/2 (1270,JP =) I = 3/2

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE
U25 *FOR COMPILATIONS + NEG. EVID. SEE ROSENFELD,OXFORD 65 SUPPL.

25 K* 3/2 (1270) MASS (MEV)

U25M	1270.0	20.0	BOCK	64 HBC

25 K* 3/2 (1270) WIDTH (MEV)

J25W	60.0	30.0	BOCK	64 HBC

25 K* 3/2 (1270) PARTIAL DECAY MODES

U25P1	K* 3/2 (1270) INTO K*(890) PI	U18S 8
U25P2	K* 3/2 (1270) INTO K RHO	S10U 9

K^+K^+ (1055)

29 K+K+ (1055,JP=) I=1 S=2

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

29 K+K+ (1055) MASS (MEV)

U29M	1055.0	20.0	FERRO-LUZ 65 HBC

29 K+K+ (1055) WIDTH (MEV)

U29W	60.0	25.0	FERRO-LUZ 65 HBC

K^+K^+ (1280)

30 K+K+ (1280,JP=) I=1 S=2

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

30 K+K+ (1280) MASS (MEV)

U30M	1280.0	20.0	FERRO-LUZ 65 HBC

J30M N NEG. RESULT, 2/3 DATA OF FERRO-L ERWIN 66 HBC SEE ROSENFELD 65

30 K+K+ (1280) WIDTH (MEV)

U30W	110.0	40.0	FERRO-LUZ 65 HBC

REFERENCES ON MESON RESONANCES

κ (725)

17 KAPPA(725,JP=)I=1/2

ALEXANDE	62 PRL 8 447	ALEXANDER,KALBFLEISCH,MILLER,SMITH//LRL+UC	U17
CONNOLLY	63 SIENA CONF 1 125	P L CONNOLLY E L HART + ///// BNL+SYRACUSE	U17
MILLER	63 PL 5 279	MILLER,ALEXANDER,DAHL,JACOBS,KALBFLEIS/LRL	U17
WOJCICKI	63 PL 5 283	S WOJCICKI,G KALBFLEISCH,M ALSTON //// LRL	U17
FERRCLUZ	64 PL 12 255	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS+ //CERN	U17
KIM	65 PL 19 350	KIM,BURLESON,KALMUS,ROBERTS + /// OHIO+ANL	U17
LONDON	66 PR 143 1034	LONDON,RAU,SAMIOS,GOLDBERG +//BNL+SYRACUSE	U17

K*(892)

18 K*(890,JP=1-)I=1/2

ALSTON	61 PRL 6 300	ALSTON,ALVAREZ,EBERHARD,GOOD,GRAZIANO+/LRL	U18
ALEXANDE	62 PRL 8 447	ALEXANDER,KALBFLEISCH,MILLER,G SMITH //LRL	U18
ARMENTER	62 CERN CONF 295	ARMENTEROS,MONTANET,D ANDLAU + ///CERN+CDF	U18
COLLEY	62 CERN CONF 315	D COLLEY,N GELFAND + //// COLUMBIA+RUTGERS	U18
CHADWICK	63 PL 6 309	CHADWICK,CRENNELL,DAVIES,BETTINI+/OXF+PADU	U18
GOLDHABE	63 ATHENS CONF 92	SULAMITH GOLDHABER /////////////////// LRL	U18
KRAEMER	63 ATHENS CONF 130	R KRAEMER L MADANSKY + //// JOHNS HOPKINS	U18
SMITH	63 PRL 10 138	SMITH,SCHWARTZ,MILLER,KALBFLEISCH,HUF+/LRL	U18
FERROLUZ	64 PL 12 255	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS+ //CERN	U18
GELSEMA	64 PL 10 341	GELSEMA,KLUYVER,TENNER,WOLTERS //// ZEEMAN	U18
WOJCICKI	64 PR 135 B 495	S WOJCICKI,M ALSTON,G KALBFLEISCH //// LRL	U18
WOJCICKI	64 PR 135 B 484	STANLEY G WOJCICKI //////////////////// LRL	U18
ARMENTER	65 PL 17 170	ARMENTEROS,EDWARDS,JACOBSEN + //CERN+PARIS	U18
FERRCLUZ	65 NC 36 1101	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS // CERN	U18
FERROLUZ	65 NC 39 417	FERRO-LUZZI,GEORGE,GOLDSCHMIDT-CLER+//CERN	U18
WANGLER	65 PR 137 B 414	WANGLER,ERWIN,WALKER /////////// WISCONSIN	U18

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS

CHINOWSK	62 PRL 9 330	CHINOWSKY,GOLDHABER,LEE,CHALLORAN //// LRL J	U18

K_c (1215)

20 KC MESON (1215,JP=) I=1/2

ARMENTER	64 DUBNA CONF 1 577	ARMENTEROS,EDWARDS,D ANDLAU +//// CERN+CDF	U20
ALSO	DUBNA CONF 1 617	R ARMENTEROS (RAPPORTEUR)	U20

Kππ (1320)

21 K2PI (1320, JP=) I = 1/2

ALMEIDA	65 PL 16 184	ALMEIDA,ATHERTON,BYER,DORNAN,FORSON+/CAMBR	U21
DE BAERE	65 OXFORD SUPPL. 53	+DEBAISIEUX,DUFOUR,JONGEJANS+ // CERN+BRUX	U21
BISHOP	66 PRL 16 1069	+GOSHAW,ERWIN,THOMPSON,WALKER,WEINBE//WISC	U21
SHEN	66 UCRL 16930--PRL	+BUTTERWORTH,FU,GOLDHABERS,TRILLING // LRL	U21

K* (1400)

22 K*(1400, JP=) I = 1/2

BADIER	65 PL 19 612	BADIER,DEMOULIN,GOLDBERG+//EP+SACLY+ZEEMAN	U22
HAQUE	65 PL 14 338	HAQUE,SCOTTER + /////BIRM,IMP COL+OXF+RUTH	U22
HARDY	65 PRL 14 401	HARDY,CHUNG,DAHL,HESS,KIRZ,MILLER //// LRL	U22
FOCARDI	65 PL 16 351	FOCARDI,MINGUZZI RANZI,SERRA+ /BOLOGNA+CEN	U22
BISHOP	66 PRL 16 1069	BISHOP,GOSHAW,ERWIN,THOMPSON+ // WISCONSIN	U22
DUBAL	66 MAGLIC PREPRINT	BAREYRE,BRIIEMAN,CHIKOVANI,MAGLIC + //CERN	U22
SHEN	66 BERKELEY CONF	+BUTTERWORTH,FU,GOLDHABER,HAGOPIAN+ //LRL	U22
AND	66 PRIVATE COMMUN.	G GOLDHABER //LRL	U22

Kππ (1800)

U23 K2PI (1800, JP=) I = 1/2

BARTSCH	66 CERN TC PHYS-15	DEUTSCHMANN,GROTE,MORRISON,+ //ABCL(IC)V	U23
	SUBMITTED TO PL		U23
DUBAL	66 MAGLIC PREPRINT	BAREYRE,BRIIEMAN,CHIKOVANI,MAGLIC + //CERN	U23

$K^*_{3/2}$ (1175)

24 K*3/2 (1175, JP=) I = 3/2 ?

WANGLER	64 PL 9 71	T P WANGLER,A R ERWIN,W D WALKER //WISCONS	U24
MILLER	65 PL 15 74	MILLER,KOVACS,MCILWAIN,PALFREY +/// PURDUE	U24
ROSENFEL	65 OXFORD CONF 58	A H ROSENFELD ////////////////// LRL--RVUE	U24
	FOR SLIGHT EVID.	FOR K*PI(1175) WITH I = 3/2 SEE BISHOP 66	U24
BISHOP	66 PRL 16 1069	+GOSHAW,ERWIN,THOMPSON,WALKER,WEINBE//WISC I	U24

$K^*_{3/2}$ (1270)

25 K*3/2 (1270, JP=) I = 3/2

BOCK	64 PL 12 65	BOCK,FRENCH,KINSON,BADIER+//CERN+PAR+ LOND	U25
ROSENFEL	65 OXFORD CONF 58	A H ROSENFELD ////////////////// LRL--RVUE	U25

K^+K^+ (1055)

29 K+K+ (1055,JP=) I=1 S=2

FERRCLUZ	65 PL 17 155	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS+ //CERN	U29

K^+K^+ (1280)

30 K+K+ (1280,JP=) I=1 S=2

FERROLUZ	65 PL 17 155	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS+ //CERN	U30
ROSENFEL	65 OXFORD CONF 58	A H ROSENFELD ////////////////// LRL--RVUE	U30
ERWIN	66 PRL 16 1063	A R ERWIN,W D WALKER,A WEINBERG//WISCONSIN	U30

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CODE     EVENTS QUANTITY  ERROR+  ERROR-   REFERENCE YR TECN SIGN COMMENTS      DATE
    ABOVE BACKGROUND                                                          PUNCHED

    N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS
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$N^*_\alpha(1400)$

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                           61  N*1/2(1400, JP=1/2+) I=1/2     P11

                           61  N*1/2(1400) MASS (MEV)    ----------------------------

U61M   *     1400.0   APPROX.          COCCONI   64 CNTR    INEL P-P
U61M         1512.0                    AUVIL     64 RVUE    PHASE-SHIFT AN.     7/66
U61M   *     1430.0   APPROX.          ANKENBRAN 65 CNTR    INEL P-P  7 GEV     7/66
U61M         1497.0                    ROPER     65 RVUE    PHASE-SHIFT ANAL
U61M   *     1425.0     14.0           ADELMAN   65 RVUE
U61M   *     1400.0   APPROX.          BELLETTIN 65 CNTR    INEL P-P AND P-D    7/66
U61M         1400.0                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/66
U61M         1380.0                    BRANDSEN  65 RVUE    PHASE-SHIFT ANAL    7/66

-------------------   61  N*1/2(1400) WIDTH (MEV)   --------------------------

U61W          260.0                    AUVIL     64 RVUE    PHASE-SHIFT AN.     7/66
U61W          210.0                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/66
U61W          210.0                    BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/66


-------------------   61  N*1/2(1400) PARTIAL DECAY MODES    ------------------

U61P1       N*1/2(1400) INTO PI N                          S 8S16
U61P2       N*1/2(1400) INTO N PI PI                       S16S 8S 8
U61P3       N*1/2(1400) INTO N*3/2(1236) PI                U81S 8

-------------------   61  N*1/2(1400) BRANCHING RATIOS    --------------------

U61R1       N*1/2(1400) INTO (PI N)/TOTAL                  (P1)/TOTAL
U61R1          0.6                     AUVIL     64 RVUE    PHASE-SHIFT AN.     7/66
U61R1          0.7                     BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/66
U61R1          0.6                     BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/66

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$N^*_\beta(1570)$

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                           62  N*1/2(1550, JP=1/2-) I=1/2     S11

                           62  N*1/2(1550) MASS (MEV)    ----------------------------

U62M         1560.0                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/66
U62M   *     1510.0        APPROX      BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/66
U62M   N     1570.0                    MICHAEL   66 RVUE    PHASE-SHIFT ANAL    7/66
       N       ABOVE PAPER USES ANALYSIS OF BAREYRE.

-------------------   62  N*1/2(1550) WIDTH (MEV)   --------------------------

U62W   N      130.0                    MICHAEL   66 RVUE    PHASE-SHIFT ANAL    7/66
       N       ABOVE PAPER USES ANALYSIS OF BAREYRE.

-------------------   62  N*1/2(1550) PARTIAL DECAY MODES    ------------------

U62P1       N*1/2(1550) INTO PI N                          S 8S16
U62P2       N*1/2(1550) INTO N ETA                         S17S14
U62P3       N*1/2(1550) INTO N PI PI                       S16S 8S 8
U62P4       N*1/2(1550) INTO N*3/2(1236) PI                U81S 8

-------------------   62  N*1/2(1550) BRANCHING RATIOS    --------------------

U62R1       N*1/2(1550) INTO (PI N)/TOTAL                  (P1)/TOTAL

U62R2       N*1/2(1550) INTO (N ETA)/TOTAL                 (P2)/TOTAL
U62R2  *   SEEN, NO RATIO QUOTED       BACCI     66 CNTR    PHOTOPRODUCTION     7/66
U62R2  *   SEEN,NO RATIO QUOTED        PREPOST   65 CNTR    PHOTOPROD.          7/66

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$N^*_\gamma(1518)$

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                           63  N*1/2(1518, JP=3/2-) I=1/2     D13

                           63  N*1/2(1518) MASS (MEV)    ----------------------------

U63M   *     1518.0     10.0           BELLETTIN 63 CNTR    PI+ PHOTOPROD.
U63M         1525.0                    AUVIL     65 RVUE    PHASE-SHIFT AN.     7/66
U63M         1530.0                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/66
U63M         1527.0                    BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/66


-------------------   63  N*1/2(1518) WIDTH (MEV)   --------------------------

U63W   *       80.0   APPROX.          BELLETTIN 63 CNTR    PI+ PHOTOPROD.
U63W           80.0                    AUVIL     64 RVUE    PHASE-SHIFT AN.     7/66
U63W           75.0                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/66
U63W          105.0                    BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/66

-------------------   63  N*1/2(1518) PARTIAL DECAY MODES    ------------------

U63P1       N*1/2(1518) INTO PI N                          S 8S16
U63P2       N*1/2(1518) INTO N ETA                         S17S14
U63P3       N*1/2(1518) INTO N PI PI                       S16S 8S 8
U63P4       N*1/2(1518) INTO N*3/2(1236) PI                U81S 8

-------------------   63  N*1/2(1518) BRANCHING RATIOS    --------------------

U63R1       N*1/2(1518) INTO (PI N)/TOTAL                  (P1)/TOTAL
U63R1          0.5                     AUVIL     64 RVUE    PHASE-SHIFT AN.     7/66
U63R1          0.5                     BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/66
U63R1          0.5                     BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/66

U63R2       N*1/2(1518) (N*3/2(1236) PI)/TOTAL             (P4)/TOTAL
U63R2         SEEN                     KIRZ      63 HBC
U63R2         SEEN                     CROUCH    65 HBC

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$N^*_\beta(1700)$

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                           64  N*1/2(1700, JP=1/2-) I=1/2     S11

                           64  N*1/2(1700) MASS (MEV)    ----------------------------

U64M   *     1700.0        APPROX      BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/6
U64M   *     1710.0        APPROX      BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/6
U64M   N     1700.0                    MICHAEL   66 RVUE    PHASE-SHIFT ANAL    7/6
       N       ABOVE PAPER USES ANALYSIS OF BAREYRE.

-------------------   64  N*1/2(1700) WIDTH (MEV)   --------------------------

U64W   N      240.0                    MICHAEL   66 RVUE    PHASE-SHIFT ANAL    7/6
       N       ABOVE PAPER USES ANALYSIS OF BAREYRE.

-------------------   64  N*1/2(1700) PARTIAL DECAY MODES  ------------------

U64P1       N*1/2(1700) INTO PI N                          S 8S16
U64P2       N*1/2(1700) INTO N ETA                         S17S14
U64P3       N*1/2(1700) INTO LAMBDA K                      S18S11
U64P4       N*1/2(1700) INTO N PI PI                       S16S 8S 8
U64P5       N*1/2(1700) INTO N*3/2(1236) PI                U81S 8

-------------------   64  N*1/2(1700)  BRANCHING RATIOS  --------------------

U64R1       N*1/2(1700) INTO (PI N)/TOTAL                  (P1)/TOTAL
U64R1          0.9    APPROX           MICHAEL   66 RVUE    PHASE-SHIFT AN.     7/6

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$N^*_\beta(1688)$

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                           65  N*1/2(1688, JP=5/2-) I=1/2     D15

                           65  N*1/2(1688) MASS (MEV)    ----------------------------

U65M         1674.0                    DUKE      65 CNTR    PI+- P EL DSIG,P    7/
U65M         1690.0                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/
U65M   *     1650.0        APPROX      BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/

-------------------   65  N*1/2(1688) WIDTH (MEV)   --------------------------

U65W          100.0                    DUKE      65 CNTR                        7/
U65W          120.0                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/
U65W           60.0                    BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/

-------------------   65  N*1/2(1688) PARTIAL DECAY MODES    ------------------
U65P1       N*1/2(1688) INTO  PI N                         S 8S16
U65P2       N*1/2(1688) INTO  N ETA                        S17S14
U65P3       N*1/2(1688) INTO  LAMBDA K                     S18S11
U65P4       N*1/2(1688) INTO  N PI PI                      S16S 8S 8
U65P5       N*1/2(1688) INTO  N*3/2(1236) PI               U81S 8

-------------------   65  N*1/2(1688) BRANCHING RATIOS    --------------------

U65R1       N*1/2(1688) INTO (PI N)/TOTAL                  (P1)/TOTAL
U65R1          0.42                    DUKE      65 CNTR                        7/
U65R1          0.35                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/
U65R1          0.35                    BRANDSEN  65 RVUE    PHASE-SHIFT AN.     7/

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$N^*_\alpha(1688)$

```
                           66  N*1/2(1688, JP=5/2+) I=1/2     F15

                           66  N*1/2(1688) MASS (MEV)    ----------------------------

U66M         1688.0        APPROX      DUKE      65 CNTR    PI+- P EL DSIG,P    7/
U66M         1695.0                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/
U66M         1685.0                    BRANDSEN  65 RVUE    PHASE SHIFT ANAL    7/

-------------------   66  N*1/2(1688) WIDTH (MEV)   --------------------------

U66W          100.0                    DUKE      65 CNTR    VERY ENERGY DEP     7/
U66W          145.0                    BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/
U66W           90.0                    BRANDSEN  65 RVUE                        7/

-------------------   66  N*1/2(1688) PARTIAL DECAY MODES    ------------------

U66P1       N*1/2(1688) INTO PI N                          S 8S16
U66P2       N*1/2(1688) INTO N ETA                         S17S14
U66P3       N*1/2(1688) INTO LAMBDA K                      S18S11
U66P4       N*1/2(1688) INTO N PI PI                       S16S 8S 8
U66P5       N*1/2(1688) INTO N*3/2(1236) PI                U81S 8

-------------------   66  N*1/2(1688) BRANCHING RATIOS    --------------------

U66R1       N*1/2(1688) INTO (PI N)/TOTAL                  (P1)/TOTAL
U66R1          0.80                    DUKE      65 CNTR                        7/
U66R1          0.5                     BAREYRE   65 RVUE    PHASE-SHIFT ANAL    7/


U66R1          0.63                    BRANDSEN  65 RVUE                        7/

U66R2       N*1/2(1688) INTO (N ETA)/TOTAL                 (P2)/TOTAL
U66R2          0.08    OR LESS         HEUSCH    66 SPRK    ETA PHOTOPROD.      7/
U66R2  *       0.02  OR LESS           KRAEMER   64 HBC

U66R3       N*1/2(1688) INTO (N*3/2(1236) PI)/TOTAL        (P5)/TOTAL
U66R3  *    SEEN ,NO RATIO QUOTED      CROUCH    65 HBC

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CODE     EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS     DATE
    ABOVE BACKGROUND                                                          PUNCHED

    N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS
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$N^*(2190)$

```
                      71  N*1/2(2190, JP=7/2-) I=1/2

                      71  N*1/2(2190) MASS (MEV)     ----------------------------

U71M          2190.0                       DIDDENS   63 CNTR    PI+- P TOTAL
U71M          2210.0                       HOHLER    64 RVUE    DATA + DISP REL
U71M          2190.0        APPROX         YOKOSAWA  66 CNTR    PI- P DSIG + POL   7/66

--------------------  71  N*1/2(2190) WIDTH (MEV)   ---------------------------

U71W           200.0                       DIDDENS   63 CNTR
U71W           200.0                       HOHLER    64 RVUE                       7/66
U71W           220.0        APPROX         YOKOSAWA  66 CNTR                       7/66

--------------------  71  N*1/2(2190) PARTIAL DECAY MODES   -------------------

U71P1       N*1/2(2190) INTO PI N                              S 8S16
U71P2       N*1/2(2190) INTO LAMBDA K                          S18S11

--------------------  71  N*1/2(2190) BRANCHING RATIOS   ---------------------

U71R1       N*1/2(2190) INTO (PI N)/TOTAL                      (P1)/TOTAL
U71R1            0.3        APPROX         DIDDENS   63 CNTR                       7/66
U71R1            0.3        APPROX         YOKOSAWA  66 CNTR                       7/66

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$N^*(2650)$

```
                      72  N*1/2(2650, JP=    ) I=1/2

                      72  N*1/2(2650) MASS (MEV)     ----------------------------

U72M   *      2700.0                       ALVAREZ   64 CNTR    PI PHOTOPROD
U72M   *      2600.0        APPROX         WAHLIG    64 SPRK 0  PI-P CH EX
U72M          2660.0                       HOHLER    64 RVUE    DATA + DISP REL
U72M          2649.0     10.0              CITRON    66 CNTR    PI+- P TOTAL       7/66

--------------------  72  N*1/2(2650) WIDTH (MEV)   ---------------------------

U72W   *       100.0                       ALVAREZ   64 CNTR
U72W           200.0                       HOHLER    64 RVUE                       7/66
U72W           360.0     20.0              CITRON    66 CNTR                       7/66

--------------------  72  N*1/2(2650) PARTIAL DECAY MODES   -------------------

U72P1       N*1/2(2650) INTO PI N                              S 8S16
U72P2       N*1/2(2650) INTO LAMBDA K                          S18S11

--------------------  72  N*1/2(2650) BRANCHING RATIOS   ---------------------


U72R1       N*1/2(2650) INTO (PI N)/TOTAL                      (P1)/TOTAL
U72R1          0.0703    0.0045            CITRON    66 CNTR    ASSUMING J=11/2    7/66

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$N^*(3030)$

```
                      73  N*1/2(3030, JP=    ) I=1/2
                          EVIDENCE GOOD BUT NOT OVERWHELMING.
                               OMITTED FROM TABLE.

                      73  N*1/2(3030) MASS (MEV)     ----------------------------

U73M          3080.0                       HOHLER    64 RVUE    DATA + DISP REL    7/66
U73M          3030.0                       CITRON    66 CNTR    PI+- P TOTAL       7/66

--------------------  73  N*1/2(3030) WIDTH (MEV)   ---------------------------

U73W           400.0                       CITRON    66 CNTR                       7/66

--------------------  73  N*1/2(3030) PARTIAL DECAY MODES   -------------------

U73P1       N*1/2(3030) INTO PI N                              S 8S16

--------------------  73  N*1/2(3030) BRANCHING RATIOS   ---------------------

U73R1       N*1/2(3030) INTO (PI N)/TOTAL                      (P1)/TOTAL
U73R1          0.0070                      CITRON    66 CNTR    ASSUMING J=15/2    7/66

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```

$N^*(3245)$

```
                      74  N* /2(3245, JP=    )
                              EVIDENCE GOOD BUT NOT OVERWHELMING.  I-SPIN NOT
                              KNOWN BUT NARROW WIDTH PRECLUDES IDENTIFICATION
                              WITH N*3/2(3230).  OMITTED FROM TABLE.

                      74  N* /2(3245) MASS (MEV)     ----------------------------

U74M          3245.0     10.0              KORMANYOS 66 CNTR    PI-P EL AT 180 D   7/66

--------------------  74  N* /2(3245) WIDTH (MEV)   ---------------------------

U74W            35.0        OR LESS        KORMANYOS 66 CNTR                       7/66

--------------------  74  N* /2(3245) PARTIAL DECAY MODES   -------------------

U74P1       N* /2(3245) INTO PI N                              S 8S16

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REFERENCES ON BARYON RESONANCES

$N^*_\alpha(1400)$

```
                   61  N*1/2(1400, JP=1/2+) I=1/2   P11   ----------
COCCONI  64 PL 8 134       LILLETHUN,SCANLON,STAHLBRANDT,TING,+//CERN      U61
AUVIL    64 PL 12 76       +LOVELACE, DONNACHIE, LEA  //IMPCOL,UNICOL IJP U61
ANKENBRA 65 NC 35 1052     ANKENBRANDT,CLYDE,CORK,KEEFE,KERTH,+ //LRL      U61
ROPER    65 PR 138 B190    LD ROPER,RM WRIGHT,BT FELD //LRL(LVMR),MIT IJP U61
ADELMAN  65 PRL 14 1043    S L ADELMAN                   //CAMBRIDGE       U61
BELLETTI 65 PL 18 167      BELLETTINI,COCCONI,DIDDENS, +        //CERN     U61
BAREYRE  65 PL 18 342      + BRICKMAN, STIRLING, VILLET      //SACLAY IJP U61
BRANDSEN 65 PR 139 B1566   BRANDSEN,O'DONNELL,MOORHOUSE //DURHAM,RTHFD IJP U61

     PAPER NOT REFERRED TO IN DATA CARDS.
        (REPLACED BY ROPER 65.)

ROPER    64 PRL 12 340     L D ROPER                     //LRL(LVMR) IJP U61
```

$N^*_\beta(1570)$

```
                   62  N*1/2(1570, JP=1/2-) I=1/2   S11   ----------
BAREYRE  65 PL 18 342      + BRICKMAN, STIRLING, VILLET      //SACLAY IJP U62
BRANDSEN 65 PR 139 B1566   BRANDSEN,O'DONNELL,MOORHOUSE //DURHAM,RTHFD IJP U62
PREPOST  65 HAMBURG CONF   PREPOST, LUNDBY, QUINN          //STANFORD      U62
BACCI    66 PRL 16 157     +PENSO,SALVINI,MENCUCCINI,+//ROME,FRASCATI      U62
MICHAEL  66 PL 21 93       C MICHAEL                            //OXF      U62
```

$N^*_\gamma(1518)$

```
SEE LAST EDITION (RMP 37, 633, 1965) FOR EARLIER REFERENCES.
                   63  N*1/2(1518, JP=3/2-) I=1/2   D13   ----------
BELLETTI 63 NC 29 1195     BELLETTINI, +      //PISA,FIRENZE,WESTFIELD     U63
KIRZ     63 PR 130 2481    J KIRZ, J SCHWARTZ, R D TRIPP        //LRL      U63
AUVIL    64 PL 12 76       +LOVELACE, DONNACHIE, LEA  //IMPCOL,UNICOL IJP U63
BAREYRE  65 PL 18 342      + BRICKMAN, STIRLING, VILLET      //SACLAY IJP U63
BRANDSEN 65 PL 19 420      BRANDSEN,O'DONNELL,MOORHOUSE //DURHAM,RTHFD IJP U63
CROUCH   65 DESY CONF      CROUCH, HARGRAVES +   // BRO+CEA+HA+MI+PA       U63
```

$N^*_\beta(1700)$

```
                   64  N*1/2(1700, JP=1/2-) I=1/2   S11   ----------
BAREYRE  65 PL 18 342      + BRICKMAN, STIRLING, VILLET      //SACLAY IJP U64
BRANDSEN 65 PL 19 420      BRANDSEN,O'DONNELL,MOORHOUSE //DURHAM,RTHFD IJP U64
MICHAEL  66 PL 21 93       C MICHAEL                            //OXF      U64
```

$N^*_\beta(1688)$

```
                   65  N*1/2(1688, JP=5/2-) I=1/2   D15   ----------
DUKE     65 PRL 15 468     +JONES,KEMP,MURPHY,PRENTICE, + //RTHFD,OXF IJP U65
BAREYRE  65 PL 18 342      + BRICKMAN, STIRLING, VILLET      //SACLAY IJP U65
BRANDSEN 65 PL 19 420      BRANDSEN,O'DONNELL,MOORHOUSE //DURHAM,RTHFD IJP U65
```

$N^*_\alpha(1688)$

```
SEE LAST EDITION (RMP 37, 633, 1965) FOR EARLIER REFERENCES.
                   66  N*1/2(1688, JP=5/2+) I=1/2   F15   ----------
DUKE     65 PRL 15 468     +JONES,KEMP,MURPHY,PRENTICE, + //RTHFD,OXF IJP U66
BAREYRE  65 PL 18 342      + BRICKMAN, STIRLING, VILLET      //SACLAY IJP U66
BRANDSEN 65 PL 19 420      BRANDSEN,O'DONNELL,MOORHOUSE //DURHAM,RTHFD IJP U66
KRAEMER  64 PR 136 B496    KRAEMER,             //HOPKINS,NWEST,WOST       U66
CROUCH   65 DESY CONF      CROUCH, HARGRAVES +   // BRO+CEA+HA+MI+PA       U66
HEUSCH   66 BERKELEY CONF. HEUSCH, PRESCOTT, CASHEN      //CALTECH         U66
```

$N^*(2190)$

```
                   71  N*1/2(2190, JP=7/2-) I=1/2   ---------------
DIDDENS  63 PRL 10 262     +JENKINS, KYCIA, RILEY              //BNL   I  U71
HOHLER   64 PL 12 149      G HOHLER, J GIESECKE          //KARLSRUHE   I  U71
YOKOSAWA 66 PRL 16 714     +SUWA,HILL,ESTERLING,BOOTH        //ARG,CHI  JP U71

     QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS.

CARROLL  66 PRL 16 288     +CORBETT,DAMERELL,MIDDLEMAS, + //RTHFD,OXF J-L U71
KORMANYO 66 PRL 16 709     KORMANYOS,KRISCH,O'FALLON, +     //MICH,ARG  P  U71
BARGER   66 PRL 16 913     V BARGER, D CLINE                  //WISC   P  U71
```

$N^*(2650)$

```
                   72  N*1/2(2650, JP=    ) I=1/2   ---------------
ALVAREZ  64 PRL 12 710     +BAR-YAM,KERN,LUCKEY,OSBORNE, +  //MIT,CEA      U72
WAHLIG   64 PRL 13 103     +MANNELLI,SODICKSON,FACKLER,WARD, +  //MIT      U72
HOHLER   64 PL 12 149      G HOHLER, J GIESECKE          //KARLSRUHE   I  U72
CITRON   66 PR 144 1101    +GALBRAITH,KYCIA,LEONTIC,PHILLIPS, + //BNL  I  U72

     PAPER NOT REFERRED TO IN DATA CARDS.
        (CITRON 64 IS REPLACED BY CITRON 66.)

CITRON   64 PRL 13 205     +GALBRAITH,KYCIA,LEONTIC,PHILLIPS, + //BNL  I  U72
```

$N^*(3030)$

```
                   73  N*1/2(3030, JP=    ) I=1/2   ---------------
HOHLER   64 PL 12 149      G HOHLER, J GIESECKE          //KARLSRUHE   I  U73
CITRON   66 PR 144 1101    +GALBRAITH,KYCIA,LEONTIC,PHILLIPS, + //BNL  I  U73
```

$N^*(3245)$

```
                   74  N* /2(3245, JP=    ) I=      ---------------
KORMANYO 66 PRL 16 709     KORMANYOS,KRISCH,O'FALLON, +     //MICH,ARG     U74
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DATA ON BARYON RESONANCES


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CODE     EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS    DATE
    ABOVE BACKGROUND                                                   PUNCHED

     N  ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS
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Δ (1236)

```
                              81  N*3/2(1236, JP=3/2+) I=3/2

                              81  N*3/2(1236) MASS (MEV)     ---------------------------

U81M    *       1234.0                      ROPER      65 RVUE C++PHASE-SHIFT ANAL
U81M++          1236.0        0.55          OLSSON     65 RVUE ++ TOTAL-SIGMA DATA

U81M++  *       1232.0        6.0           FERRO-LUZ  65 HBC  ++ K+P TC KO P PI+
U81M++  *       1233.4        4.4           GIDAL      66 DBC  ++ D D TC NN(NN) PI   7/66
U81M++          1236.0                      DEANS      66 RVUE ++ PI+P TOTAL         7/66
U81M0           1236.45       0.65          OLSSON     65 RVUE 0
U81M-   *       1241.3        5.1           GIDAL      66 DBC  -                     7/66

--------------------  81  N*(0) - N*(++) MASS DIFFERENCE (MEV)    ------------

U81D                0.45      0.85          OLSSON     65 RVUE    SEE MASS CARDS

--------------------  81  N*(-) - N*(++) MASS DIFFERENCE (MEV)    ------------

U81D                7.9       6.8           GIDAL      66 DBC     SEE MASS CARDS

--------------------  81  N*3/2(1236) WIDTH (MEV)     --------------------------

U81W++           120.0        2.0           OLSSON     65 RVUE ++
U81W++  *        125.0       30.0           FERRO-LUZ  65 HBC  ++
U81W++  *        124.0       14.0           GIDAL      66 DBC  ++                    7/66
U81W++           121.0                      DEANS      66 RVUE ++ PI+P TOTAL         7/66
U81W0            119.6        2.4           OLSSON     65 RVUE 0
U81W-   *        149.0       18.0           GIDAL      66 DBC  -                     7/66

--------------------  81  N*3/2(1236) PARTIAL DECAY MODES    -----------------

U81P1        N*3/2(1236) INTO PI N                                  S 8S16

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```

Δ (1670)

```
                              82  N*3/2(1670, JP=1/2-) I=3/2

                              82  N*3/2(1670) MASS (MEV)     ---------------------------

U82M            1648.0       12.0           DEVLIN     65 CNTR    PI+- P TOTAL
U82M            1665.0                      BAREYRE    65 RVUE    PHASE SHIFT ANAL   7/66
U82M            1692.0                      DONNACHIE  65 RVUE    PHASE S + DISP R   7/66

--------------------  82  N*3/2(1670) WIDTH (MEV)     --------------------------

U82W             201.0       74.0           DEVLIN     65 CNTR    VERY ASYMMETRIC
U82W             130.0                      BAREYRE    65 RVUE                       7/66
U82W             230.0                      DONNACHIE  65 RVUE                       7/66

--------------------  82  N*3/2(1670) PARTIAL DECAY MODES    -----------------

U82P1        N*3/2(1670) INTO PI N                                  S 8S16

--------------------  82  N*3/2(1670) BRANCHING RATIOS     -------------------

U82R1        N*3/2(1670) INTO (PI N)/TOTAL                          (P1)/TOTAL
U82R1             0.56                      DEVLIN     65 CNTR
U82R1             0.33                      BAREYRE    65 RVUE                       7/66
U82R1             0.44                      DONNACHIE  65 RVUE                       7/66

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Δ (1920)

```
                              83  N*3/2(1920, JP=7/2+) I=3/2

                              83  N*3/2(1920) MASS (MEV)     ---------------------------

U83M            1922.0            APPROX    COOL       56 CNTR    PI+ P TOTAL        7/66
U83M            1912.0       15.0           BRISSON    61 CNTR    PI+ P TOTAL        7/66
U83M    N       1956.0                      LAYSON     63 RVUE    PI P TOTAL, EL     7/66
        N       ASSUMES AN N*3/2(1855).
U83M            1920.0                      HOHLER     64 RVUE    DATA + DISP REL    7/66
U83M            1900.0        9.0           DEVLIN     65 CNTR    PI+ P TOTAL
U83M            1920.0            APPROX    DUKE       65 CNTR    PI+- P EL, POLAR   7/66
U83M            1950.0            APPROX    YOKOSAWA   66 CNTR    PI- P DSIG + POL   7/66

--------------------  83  N*3/2(1920) WIDTH (MEV)     --------------------------

U83W             170.0                      HOHLER     64 RVUE                       7/66
U83W             256.0       39.0           DEVLIN     65 CNTR
U83W             170.0                      DUKE       65 CNTR                       7/66
U83W             200.0            APPROX    YOKOSAWA   66 CNTR                       7/66

--------------------  83  N*3/2(1920) PARTIAL DECAY MODES    -----------------

U83P1        N*3/2(1920) INTO PI N                                  S 8S16

--------------------  83  N*3/2(1920) BRANCHING RATIOS     -------------------

U83R1        N*3/2(1920) INTO (PI N)/TOTAL                          (P1)/TOTAL
U83R1   N         0.33                      LAYSON     63 RVUE                       7/66
        N    ASSUMES AN N*3/2(1855).
U83R1             0.73       OR LESS        HOHLER     63 RVUE    DATA + DISP REL    7/66
U83R1             0.67       OR LESS        AUVIL      64 RVUE    PI+ P ELASTIC
U83R1             0.57       0.12           DEVLIN     65 CNTR
U83R1             0.41                      DUKE       65 CNTR    VERY ENERGY DEP    7/66
U83R1             0.4             APPROX    YOKOSAWA   66 CNTR                       7/66

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Δ (2420)

```
                              84  N*3/2(2420, JP=   +) I=3/2

                              84  N*3/2(2420) MASS (MEV)     ---------------------------

U84M            2360.0                      DIDDENS    63 CNTR    PI+ P TOTAL
U84M    *       2520.0       40.0           ALVAREZ    64 CNTR    PI PHCTOPROD       7/66
U84M    *       2400.0            APPROX    WAHLIG     64 SPRK 0  PI-P CH EX
U84M            2440.0                      HOHLER     64 RVUE    DATA + DISP REL
U84M            2423.0       10.0           CITRON     66 CNTR    PI+ P TOTAL        7/66

--------------------  84  N*3/2(2420) WIDTH (MEV)     --------------------------

U84W             200.0                      DIDDENS    63 CNTR
U84W             245.0                      HOHLER     64 RVUE                       7/66
U84W             310.0       20.0           CITRON     66 CNTR                       7/66

--------------------  84  N*3/2(2420) PARTIAL DECAY MODES    -----------------

U84P1        N*3/2(2420) INTO PI N                                  S 8S16
U84P2        N*3/2(2420) INTO SIGMA K                               S20S10

--------------------  84  N*3/2(2420) BRANCHING RATIOS     -------------------

U84R1        N*3/2(2420) INTO (PI N)/TOTAL                          (P1)/TOTAL
U84R1             0.067           APPROX    DIDDENS    63 CNTR    ASSUMING J=11/2    7/66
U84R1             0.113      0.0036         CITRON     66 CNTR    ASSUMING J=11/2    7/66

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Δ (2850)

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                              85  N*3/2(2850, JP=    ) I=3/2

                              85  N*3/2(2850) MASS (MEV)     ---------------------------

U85M    *       2700.0            APPROX    WAHLIG     64 SPRK C  PI-P CH EX
U85M            2870.0                      HOHLER     64 RVUE    DATA + DISP REL
U85M            2850.0       12.0           CITRON     66 CNTR    PI+ P TOTAL        7/66
U85M            2850.0                      BARDADIN   66 HBC  ++ N* TO P + 3 PIS    7/66

--------------------  85  N*3/2(2850) WIDTH (MEV)     --------------------------

U85W             400.0       40.0           CITRON     66 CNTR                       7/66
U85W             150.0                      BARDADIN   66 HBC  ++                    7/66

--------------------  85  N*3/2(2850) PARTIAL DECAY MODES    -----------------

U85P1        N*3/2(2850) INTO PI N                                  S 8S16
U85P2        N*3/2(2850) INTO P PI PI PI                            S16S 8S 8S 8

--------------------  85  N*3/2(2850) BRANCHING RATIOS     -------------------

U85R1        N*3/2(2850) INTO (PI N)/TOTAL                          (P1)/TOTAL
U85R1             0.0314     0.0025         CITRON     66 CNTR    ASSUMING J=15/2    7/66

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Δ (3230)

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                              86  N*3/2(3230, JP=    ) I=3/2
                                 EVIDENCE GOOD BUT NOT OVERWHELMING.
                                     OMITTED FROM TABLE.

                              86  N*3/2(3230) MASS (MEV)     ---------------------------

U86M            3230.0                      CITRON     66 CNTR    PI+ P TOTAL        7/66

--------------------  86  N*3/2(3230) WIDTH (MEV)     --------------------------

U86W             440.0                      CITRON     66 CNTR                       7/66

--------------------  86  N*3/2(3230) PARTIAL DECAY MODES    -----------------

U86P1        N*3/2(3230) INTO PI N                                  S 8S16

--------------------  86  N*3/2(3230) BRANCHING RATIOS     -------------------

U86R1        N*3/2(3230) INTO (PI N)/TOTAL                          (P1)/TOTAL
U86R1             0.0063                    CITRON     66 CNTR    ASSUMING J=19/2    7/66

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$N^*_{5/2}$ (1570)

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                              91  N*5/2(1570, JP=    ) I=5/2
                                     POSSIBLE KINEMATIC EFFECT.  SEE DASH 65.
                                     OMITTED FROM TABLE.

                              91  N*5/2(1570) MASS (MEV)     ---------------------------

U91M            1560.0       20.0           GOLDHABER 64 HBC  +++3.65 BEV/C PI+ P   7/66
U91M            1580.0       20.0           ALEXANDER 65 HBC  +++5.5 BEV/C P P      7/66

--------------------  91  N*5/2(1570) WIDTH (MEV)     --------------------------

U91W             220.0       20.0           GOLDHABER 64 HBC  +++                   7/66
U91W             200.0       20.0           ALEXANDER 65 HBC  +++                   7/66

--------------------  91  N*5/2(1570) PARTIAL DECAY MODES    -----------------

U91P1        N*5/2(1570) INTO N PI PI                               S16S 8S 8
U91P2        N*5/2(1570) INTO N*3/2(1236) PI                        U81S 8

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Z^*_0 (1865)

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                              56  Z*0(1865, JP=    ) I=0
                                     EVIDENCE GOOD BUT NOT OVERWHELMING.

                              56  Z*0(1865) MASS (MEV)     ---------------------------

U56M            1863.0                      COOL       66 CNTR +  K+ P, D TOTAL      7/66

--------------------  56  Z*0(1865) WIDTH (MEV)     ----------------------------

U56W             150.0                      COOL       66 CNTR +                     7/66

--------------------  56  Z*0(1865) PARTIAL DECAY MODES    -------------------

U56P1        Z*0(1865) INTO K N                                     S10S17
U56P2        Z*0(1865) INTO N*3/2(1236) K                           U81S10

--------------------  56  Z*0(1865) BRANCHING RATIOS     ---------------------

U56R1        Z*0(1865) INTO (K N)/TOTAL                             (P1)/TOTAL
U56R1             0.55                      COOL       66 CNTR +  IF J=1/2           7/66

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Z^*_1 (1910)

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                              57  Z*1(1910, JP=    ) I=1
                                     PROBABLE KN* THRESHOLD EFFECT.
                                     OMITTED FROM TABLE.

                              57  Z*1(1910) MASS (MEV)     ---------------------------

U57M            1910.0       20.0           COOL       66 CNTR ++ K+ P TOTAL         7/66

--------------------  57  Z*1(1910) WIDTH (MEV)     ----------------------------

U57W             180.0                      COOL       66 CNTR ++                    7/

--------------------  57  Z*1(1910) PARTIAL DECAY MODES    -------------------

U57P1        Z*1(1910) INTO K N                                     S10S16
U57P2        Z*1(1910) INTO K N PI                                  S10S16S 9

--------------------  57  Z*1(1910) BRANCHING RATIOS     ---------------------

U57R1        Z*1(1910) INTO (K N)/TOTAL                             (P1)/TOTAL
U57R1             0.31                      COOL       66 CNTR ++ IF J=1/2           7/

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REFERENCES ON BARYON RESONANCES

AUTHCR	YR	JOLRNAL VCL. PAGE	ALTHCRS	// LABCRATCRIES		CCDE

Δ (1236)

81 N*3/2(1236, JP=3/2+) I=3/2

(FCR EXTENSIVE REFERENCES TC DATA AND TO PHASE-SHIFT ANALYSES, SEE RCPER 65, ESPECIALLY APPENCIX II.)

CLSSCN	65	PRL 14 118	M G CLSSCN	//WISC		U81
FERRC-LU	65	NC 36 1101	FERRO-LUZZI,GECRGE, +	//CERN		U81
RCPER	65	PR 138 B19C	L D RCPER, R M WRIGHT, B T FELC	//LRL,MIT	JP	U81
CIDAL	66	PR 141 1261	G GICAL, A KERNAN, S KIM	//LRL		U81
CEANS	66	PREPRINT	S R DEANS, W G HCLLACAY	//VANDERBILT		U81

PAPER NCT REFERRED TC IN DATA CARCS.

KLEPIKOV	6C	JINR D-584 DUBNA	KLEPIKCV, MESHCHERYAKCV, SCKOLCV	//CUBNA		U81

Δ (1670)

82 N*3/2(1670, JP=1/2-) I=3/2

CEVLIN	65	PRL 14 1C31	T J CEVLIN,J SCLCMCN,G BERTSCH	//PRINCETON	I	U82
BAREYRE	65	PL 18 342	+ BRICKMAN, STIRLING, VILLET	//SACLAY	IJP	U82
CCNNACHI	65	PL 19 146	A CCNNACHIE,AT LEA,C LCVELACE	//UNICCL,CERN	IJP	U82

PAPERS NCT REFERREC TC IN CATA CARCS.

CARRUTHE	6C	PRL 4 303	P CARRLTHERS	//CORNELL	I	U82
CEVLIN	62	PR 125 69C	T J CEVLIN, E J MCYER, V PEREZ-MENCEZ	//LRL	I	U82
HELLAND	64	PR 134 B1C62	+DEVLIN,HAGGE,LCNGC,MCYER,WCCD	//LRL	I	U82

Δ (1920)

83 N*3/2(1920, JP=7/2+) I=3/2

COCL	56	PR 1C3 1082	R CCCL, O PICCICNI, D CLARK	//BNL	I	U83
ERISSON	61	NC 19 21C	+DETCELF,FALK-VAIRANT,VAN RCSSUM,+	//SACLAY	I	U83
LAYSCN	63	NC 27 724	W M LAYSCN	//CERN	IJ	U83
HOHLER	63	NP 48 47C	G HCHLER, G EBEL	//KARLSRUHE	I	U83
ALVIL	64	NC 33 473	P ALVIL, C LCVELACE	//IMPCCL	IJP	U83
HCHLER	64	PL 12 149	G HCHLER, J GIESECKE	//KARLSRUHE	I	U83
CEVLIN	65	PRL 14 1C31	T J DEVLIN,J SCLCMCN,G BERTSCH	//PRINCETCN	I	U83
CUKE	65	PRL 15 468	+JONES,KEMP,MURPHY,PRENTICE, +	//RTHFC,CXF	IJP	U83
YOKOSAWA	66	PRL 16 714	+SUWA,HILL,ESTERLING,BOOTH	//ARG,CHI	IJP	U83

QUANTUM NUMBER DETERMINATICN NCT REFERREC TC IN CATA CARCS.

HELLANC	64	PR 134 B1C62	+DEVLIN,HAGGE,LCNGC,MCYER,WCCC	//LRL	IJ	U83

Δ (2420)

84 N*3/2(242C, JP= +) I=3/2

CICDENS	63	PRL 1C 262	+JENKINS, KYCIA, RILEY	//BNL	I	U84
ALVAREZ	64	PRL 12 710	+BAR-YAM,KERN,LUCKEY,CSBCRNE, +	//MIT,CEA		U84
WAHLIG	64	PRL 13 1C3	+MANNELLI,SCCICKSCN,FACKLER,WARD, +	//MIT		U84
HCHLER	64	PL 12 149	G HCHLER, J GIESECKE	//KARLSRUHE	I	U84
CITRCN	66	PR 144 1101	+GALBRAITH,KYCIA,LECNTIC,PHILLIPS, +	//BNL	I	U84

PAPERS NCT REFERRED TC IN CATA CARCS.
(CITRCN 64 IS REPLACEC BY CITRCN 66.)

CITRCN	64	PRL 13 205	+GALBRAITH,KYCIA,LECNTIC,PHILLIPS, +	//BNL	I	U84
BARGER	66	PRL 16 913	V BARGER, C CLINE	//WISC	P	U84

Δ (2850)

85 N*3/2(2850, JP=) I=3/2

WAHLIG	64	PRL 13 1C3	+MANNELLI,SCCICKSCN,FACKLER,WARD, +	//MIT		U85
HCHLER	64	PL 12 149	G HCHLER, J GIESECKE	//KARLSRUHE	I	U85
CITRCN	66	PR 144 11C1	+GALBRAITH,KYCIA,LECNTIC,PHILLIPS, +	//BNL	I	U85
BARCADIN	66	PL 21 357	BARDACIN-CTWINCWSKA,CANYSZ, +	//WARSAW		U85

PAPER NCT REFERREC TC IN CATA CARCS.
(CITRCN 64 IS REPLACEC BY CITRCN 66.)

CITRCN	64	PRL 13 2C5	+GALBRAITH,KYCIA,LECNTIC,PHILLIPS, +	//BNL	I	U85

Δ (3230)

86 N*3/2(323C, JP=) I=3/2

CITRCN	66	PR 144 1101	+GALBRAITH,KYCIA,LECNTIC,PHILLIPS, +	//BNL	I	U86

$N^*_{5/2}$(1570)

91 N*5/2(157C, JP=) I=5/2

GOLCHABE	64	CUBNA CCNF I 48C	G+S GCLCHABER,CHALLCRAN,SHEN	//LRL(BNL)	I	U91
ALEXANDE	65	PRL 15 207	ALEXANCER,BENARY,REUTER,+	//WEIZMANN(CERN)	I	U91

PAPER NCT REFERREC TC IN DATA CARCS.

CASH	65	LRL UCIC-2752	J CASH, G GCLCHABER, J SWIHART	//LRL		U91

Z^*_0 (1865)

56 Z*0(1865, JP=) I=0

COCL	66	PRL 17 102	+GIACCMELLI,KYCIA,LEONTIC,LI,LUNDBY,+	//BNL	I	U56

Z^*_1 (1910)

57 Z*1(1910, JP=) I=1

CCCL	66	PRL 17 102	+GIACCMELLI,KYCIA,LECNTIC,LI,LUNCBY,+	//BNL	I	U57

CODE		EVENTS ABOVE BACKGROUND	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECH	SIGN	COMMENTS	DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

Y_0^*(1405)

37 Y*0(1405, JP=1/2-) I=0

37 Y*0(1405) MASS (MEV)

U37M			1405.0			ALSTON	61	HBC		K-P TC SIG + PIS	7/66
U37M			1410.0			ALEXANDER	62	HBC		PI-P TO SIG PI K	
U37M			1405.0			ALSTON	62	HBC		K-P TC SIG + PIS	
U37M			1400.0	24.0		MUSGRAVE	65	HBC		PBAR P TO YBAR Y	7/66
U37M	*		1382.0	8.0		ENGLER	65	HDBC		PI N TO SIG PI K	7/66
U37M			1410.7	1.0		KIM	65	HBC		EFF RANGE FIT	7/66
U37M	N		1409.6	1.7		SAKITT	65	HBC		EFF RANGE FIT	7/66
	N		DATA OF SAKITT ARE USED IN FIT BY KITTEL.								
U37M			1407.5	1.2		KITTEL	66	HBC		EFF RANGE FIT	7/66

37 Y*0(1405) WIDTH (MEV)

U37W			20.0			ALSTON	61	HBC			7/66
U37W			35.0	5.0		ALEXANDER	62	HBC			
U37W			50.0			ALSTON	62	HBC			
U37W			60.0	20.0		MUSGRAVE	65	HBC			7/66
U37W	*		89.0	20.0		ENGLER	65	HDBC			7/66
U37W			37.0	3.2		KIM	65	HBC			7/66
U37W	N		28.2	4.1		SAKITT	65	HBC			7/66
	N		DATA OF SAKITT ARE USED IN FIT BY KITTEL.								
U37W			34.1	4.1		KITTEL	66	HBC			7/66

37 Y*0(1405) PARTIAL DECAY MODES

U37P1	Y*0(1405) INTO SIGMA PI	S20S 8

Y_0^*(1520)

38 Y*0(1520, JP=3/2-) I=0

38 Y*0(1520) MASS (MEV)

U38M			1519.4	2.0		WATSON	63	HBC		K-P ALL CHANNELS	
U38M		145	1517.2	3.0		GALTIERI	63	DBC		INVM(K-P)	
U38M			1520.0	4.0		ALMEIDA	64	HBC		INVM(K-P)	
U38M			1511.0	15.0		MUSGRAVE	65	HBC		INVM(SIGMA PI)	7/66

38 Y*0(1520) WIDTH (MEV)

U38W			16.4	2.0		WATSON	63	HBC		K-P ALL CHANNELS	
U38W			19.0	19.0		MUSGRAVE	65	HBC		INVM(SIGMA PI)	7/66

38 Y*0(1520) PARTIAL DECAY MODES

U38P1	Y*0(1520) INTO KBAR N	S11S17
U38P2	Y*0(1520) INTO SIGMA PI	S20S 8
U38P3	Y*0(1520) INTO LAMBDA PI PI	S18S 8S 8

38 Y*0(1520) BRANCHING RATIOS

U38R1	Y*0(1520) INTO (KBAR N)/TOTAL						(P1)/TOTAL	
U38R1	0.293	0.035		WATSON	63	HBC	K-P EL, CH EX	
U38R2	Y*0(1520) INTO (SIGMA PI)/TOTAL						(P2)/TOTAL	
U38R2	0.546	0.067		WATSON	63	HBC	K-P TC SIGMA PI	
U38R3	Y*0(1520) INTO (LAMBDA PI PI)/TOTAL						(P3)/TOTAL	
U38R3	0.16	0.02		WATSON	63	HBC	K-P TC LAM PI PI	
U38R4	Y*0(1520) INTO (KBAR N)/(SIGMA PI)						(P1)/(P2)	
U38R4	0.58	0.26		MUSGRAVE	65	HBC	INVM(K N,SIG PI)	7/66
U38R5	Y*0(1520) INTO (SIGMA PI)/(LAMBDA PI PI)						(P2)/(P3)	
U38R5	4.5	1.0		ARMENTERO	65	HBC		7/66

Y_0^*(1670)

40 Y*0(1670, JP=1/2-) I=0
ALSO POSSIBLE TO INTERPRET AS SCATTERING LENGTH EFFECT.

40 Y*0(1670) MASS (MEV)

U40M			1680.0			YUNG-CHAN	64	PBC			7/66
U40M			1670.0			BERLEY	65	HBC		K-P TO LAMDA ETA	7/66

40 Y*0(1670) WIDTH (MEV)

U40W			20.0	OR LESS		YUNG-CHAN	64	PBC			7/66
U40W			18.0			BERLEY	65	HBC			7/66

40 Y*0(1670) PARTIAL DECAY MODES

U40P1	Y*0(1670) INTO KBAR N	S11S17
U40P2	Y*0(1670) INTO LAMBDA ETA	S18S14

40 Y*0(1670) BRANCHING RATIOS

U40R1	*	Y*0(1670) INTO ((KBAR N)(LAM ETA))/TOTAL**2						(P1*P2)/TOTAL**2	
U40R1	*	0.046			BERLEY	65	HBC		7/66

Y_0^*(1815)

39 Y*0(1815, JP=5/2+) I=0

39 Y*0(1815) MASS (MEV)

U39M			1815.0			GALTIERI	63			K-P RVUE	7/66
U39M			1815.0			BIRGE	65	HBC		KBAR N,LAM PI PI	7/66
U39M			1820.0	5.0		TRIPP	66	HBC		K-P EL, CH EX	7/66

39 Y*0(1815) WIDTH (MEV)

U39W			70.0			GALTIERI	63			K-P RVUE	
U39W			60.0			BIRGE	65	HBC		KBAR N,LAM PI PI	7/66
U39W			45.0	5.0		TRIPP	66	HBC		K-P EL, CH EX	7/66

39 Y*0(1815) PARTIAL DECAY MODES

U39P1	Y*0(1815) INTO KBAR N	S11S17
U39P2	Y*0(1815) INTO SIGMA PI	S20S 8
U39P3	Y*0(1815) INTO LAMBDA ETA	S18S14
U39P4	Y*0(1815) INTO Y*1(1385) PI	U43S 8

39 Y*0(1815) BRANCHING RATIOS

U39R1	Y*0(1815) INTO (KBAR N)/TOTAL						(P1)/TOTAL	
U39R1	0.8			GALTIERI	63		K-P RVUE	
U39R1	0.70			TRIPP	66	HBC	K-P EL, CH EX	7/66
U39R2	Y*0(1815) INTO (SIGMA PI)/TOTAL						(P2)/TOTAL	
U39R2	0.09			TRIPP	66	HBC	K-P TC SIGMA PI	7/66
U39R3	Y*0(1815) INTO (LAMBDA ETA)/TOTAL						(P3)/TOTAL	
U39R3	0.01			TRIPP	66	HBC	K-P TC LAMDA ETA	7/6
U39R4	Y*0(1815) INTO (Y*1(1385) PI)/TOTAL							
U39R4	0.20	0.05		BIRGE	65	HBC	K-P TC Y*1 PI	7/66
U39R4	0.15			TRIPP	66	HBC	K-P TC Y*1 PI	7/66

Y_0^*(2110)

41 Y*0(2110, JP=7/2-) I=0

41 Y*0(2110) MASS (MEV)

U41M	*		2097.0	6.0		BOCK	65	HBC		INVM(K N (PI))	7/66
U41M			2100.0	20.0		COOL	66	CNTR		K-P TOTAL	7/66
U41M			2120.0	20.0		WOHL	66	HBC		K-P CH EX	7/66

41 Y*0(2110) WIDTH (MEV)

U41W	*		24.0	14.0	24.0	BOCK	65	HBC		INVM(K N (PI))	7/66
U41W			160.0			COOL	66	CNTR		K-P TOTAL	7/66
U41W			145.0			WOHL	66	HBC		K-P CH EX	7/66

41 Y*0(2110) PARTIAL DECAY MODES

U41P1	Y*0(2110) INTO KBAR N	S11S17
U41P2	Y*0(2110) INTO SIGMA PI	S20S 8

41 Y*0(2110) BRANCHING RATIOS

U41R1	Y*0(2110) INTO (KBAR N)/TOTAL						(P1)/TOTAL	
U41R1	0.39			COOL	66	CNTR	K-P TOTAL	7/6
U41R1	0.25			WOHL	66	HBC	K-P CH EX	7/6

Y_0^*(2340)

42 Y*0(2340, JP=) I=0
EVIDENCE GOOD BUT NOT OVERWHELMING.
OMITTED FROM TABLE.

42 Y*0(2340) MASS (MEV)

U42M			2340.0	20.0		COOL	66	CNTR		K-P, D TOTAL	7/6

42 Y*0(2340) WIDTH (MEV)

U42W			105.0			COOL	66	CNTR			7/6

42 Y*0(2340) PARTIAL DECAY MODES

U42P1	Y*0(2340) INTO KBAR N	S11S17

42 Y*0(2340) BRANCHING RATIOS

U42R1	Y*0(2340) INTO (KBAR N)/TOTAL						(P1)/TOTAL	
U42R1	0.102			COOL	66	CNTR	ASSUMING J=9/2	7/6

Y_1^*(1385)

43 Y*1(1385, JP=3/2+) I=1

43 Y*1(1385) MASS (MEV)
(* ONLY UNSTARRED DATA -- CAREFUL ATTEMPTS TO
OBTAIN SEPARATE CHARGE-STATE MASSES -- ARE USED.)

U43M	*	141	1384.0			ALSTON	60	HBC	+-	K-P 1.15 BEV/C	
U43M-	*	93	1382.0	3.0		DAHL	61	DBC	-	K-D 0.45 BEV/C	
U43M	*	38	1384.0			MARTIN	61	HBC	C+	K20 P .98 BEV/C	
U43M	*		1385.0			BERGE	61	HBC	+-	K-P .4-.85 BEV/C	
U43M	*		1392.0	7.0		COLLEY	62	PBC	0-	PI- PRP 2. BEV/C	
U43M0	*	106	1381.0	4.0		CURTIS	63	SPRK	C	PI-P 1.5 BEV/C	
U43M+	*	80	1384.0	4.0		FOELSCHE	64	HBC	+		
U43M	*		1392.0	10.0		MUSGRAVE	65	HBC	+-0	PBAR P TO YBAR Y	7/6
U43M	*		1389.0	3.0		BALTAY	65	HBC	+-	PBAR P TO YBAR Y	7/6
U43M+		154	1376.0	3.0		ELY	61	PBC	+	K-P 1.11 BEV/C	
U43M+		170	1375.0	3.9		COOPER	64	HBC	+	K-P 1.45 BEV/C	
U43M+		859	1381.0	1.6		HUWE	64	HBC	+	K-P 1-1.7 BEV/C	
U43M+			1382.0	1.0		ARMENTERO	65	HBC	+	K-P .9-1.2 BEV/C	
U43M+			1378.0	5.0		LONDON	66	HBC	+	K-P 2.24 BEV/C	7/6
U43M-		224	1376.0	3.0		ELY	61	PBC	-		
U43M-		200	1392.0	6.2		COOPER	64	HBC	-		
U43M-		1086	1385.3	1.5		HUWE	64	HBC	-		
U43M-			1384.0	1.0		ARMENTERO	65	HBC	-		
U43M-			1389.0	9.0		LONDON	66	HBC	-		7/6

CODE EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR TECN SIGN COMMENTS DATE PUNCHED
ABOVE BACKGROUND

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

43 Y*(-) - Y*(+) MASS DIFFERENCE (MEV)

CODE	N	QUANTITY	ERROR	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED
U43D		9.0	6.0	LONDON	66	HBC	+-	LAMBDA 3 PI EVTS	7/66

43 Y*1(1385) WIDTH (MEV)
(* ONLY UNSTARRED DATA -- CAREFUL ATTEMPTS TO OBTAIN SEPARATE CHARGE-STATE WIDTHS -- ARE USED.)

CODE	N	QUANTITY	ERROR	REFERENCE	YR	TECN	SIGN	DATE PUNCHED
U43W	*	64.0		ALSTON	60	HBC	+-	
U43W	*	40.0		DAHL	61	DBC	-	
U43W	*	20.0	OR LESS	MARTIN	61	HBC	0+	
U43W	*	40.0		BERGE	61	HBC	+-	
U43W	*	80.0	10.0	COLLEY	62	PBC	C-	
U43W	*	30.0	9.0	CURTIS	63	SPRK	C	
U43W	*	30.0	7.0	FOELSCHE	64	HBC	+	
U43W	*	38.0	9.0	MUSGRAVE	65	HBC	+-0	7/66
U43W	*	26.0	5.0	BALTAY	65	HBC	+-	7/66
U43W+		48.0	8.0	ELY	61	PBC	+	
U43W+		51.0	10.0	COOPER	64	HBC	+	
U43W+		46.5	3.0	HUWE	64	HBC	+	
U43W+		32.0	3.0	ARMENTERO	65	HBC	+	
U43W-		66.0	10.0	ELY	61	PBC	-	
U43W-		88.0	10.0	COOPER	64	HBC	-	
U43W-		62.0	7.0	HUWE	64	HBC	-	
U43W-		38.0	3.0	ARMENTERO	65	HBC	-	

43 Y*1(1385) PARTIAL DECAY MODES

U43P1	Y*1(1385) INTO LAMBDA PI	S18S 8
U43P2	Y*1(1385) INTO SIGMA PI	S20S 8

43 Y*1(1385) BRANCHING RATIOS

CODE	N	QUANTITY	ERROR	REFERENCE	YR	TECN	SIGN	DATE PUNCHED
U43R1		Y*1(1385) INTO (SIGMA PI)/(LAMBDA PI)		(P2)/(P1)				
U43R1		0.04	0.04	BASTIEN	61	HBC	+-	
U43R1	*	0.14	OR LESS	ALSTON	62	HBC	+-0	
U43R1		0.09	0.04	HUWE	64	HBC	+-	
U43R1		0.163	0.035	ARMENTERO	65	HBC	+-	7/66
U43R1		0.08	0.06	LONDON	66	HBC	+	7/66

$Y^*_1(1660)$

44 Y*1(1660, JP=3/2) I=1

44 Y*1(1660) MASS (MEV)

CODE	QUANTITY	ERROR	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED
U44M	1685.0		ALEXANDER	62	HBC	C-	INVM(LAM,SIG PI)	
U44M	1660.0	10.0	ALVAREZ	63	HBC	+		
U44M	1660.0		BERLEY	64	HBC	0	K-P TC LAM PIO	7/66
U44M	1645.0	7.0	LEVEQUE	65	HBC	+	K-P TC Y*1660 PI	7/66

44 Y*1(1660) WIDTH (MEV)

CODE	QUANTITY	ERROR	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED
U44W	45.0		ALEXANDER	62	HBC	0-	INVM(LAM,SIG PI)	
U44W	40.0	10.0	ALVAREZ	63	HBC	+		
U44W	60.0		BERLEY	64	HBC	C	K-P TC LAM FIO	7/66
U44W	55.0	10.0	LEVEQUE	65	HBC	+		7/66

44 Y*1(1660) PARTIAL DECAY MODES

U44P1	Y*1(1660) INTO KBAR N	S11S17
U44P2	Y*1(1660) INTO LAMBDA PI	S18S 8
U44P3	Y*1(1660) INTO SIGMA PI	S2CS 8
U44P4	Y*1(1660) INTO LAMBDA PI PI	S18S 8S 8
U44P5	Y*1(1660) INTO SIGMA PI PI	S20S 8S 8
U44P6	Y*1(1660) INTO Y*1(1385) PI	U43S 8
U44P7	Y*1(1660) INTO Y*0(1405) PI	U37S 8

44 Y*1(1660) BRANCHING RATIOS

CODE	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED
U44R1	Y*1(1660) INTO (KBAR N)/TOTAL			(P1)/TOTAL					
U44R1	0.05	OR LESS		ALVAREZ	63	HBC	+		
U44R1	0.16	OR MORE		BASTIEN 2	63	HBC	0		
U44R1	0.2	OR LESS		LONDON	66	HBC	+		7/66
U44R2	Y*1(1660) INTO (LAMBDA PI)/TOTAL			(P2)/TOTAL					
U44R2	0.32			ALVAREZ	63	HBC	+		
U44R2	0.09	OR LESS		BASTIEN 2	63	HBC	C		
U44R2	0.2	OR LESS		LONDON	66	HBC	+		7/66
U44R2	0.06	0.06		SMART	66	DBC	-	ASSUMING R1=0.15	7/66
U44R3	Y*1(1660) INTO (SIGMA PI)/TOTAL			(P3)/TOTAL					
U44R3	0.27			ALVAREZ	63	HBC	+		
U44R3	0.22	0.06		BASTIEN 2	63	HBC	0		
U44R3	0.25	0.15		LONDON	66	HBC	+		7/66
U44R4	Y*1(1660) INTO (LAMBDA PI PI)/TOTAL			(P4)/TOTAL					
U44R4	0.18			ALVAREZ	63	HBC	+		
U44R4	0.16	0.05		BASTIEN 2	63	HBC	0		
U44R4	0.2	OR LESS		LONDON	66	HBC	+		7/66
U44R5	Y*1(1660) INTO (SIGMA PI PI)/TOTAL			(P5)/TOTAL					
U44R5	0.18			ALVAREZ	63	HBC	+		
U44R5	0.25	0.06		BASTIEN 2	63	HBC	C		
U44R6	Y*1(1660) INTO (Y*0(1405) PI)/TOTAL			(P7)/TOTAL					
U44R6	0.75	0.25		LONDON	66	HBC	+		7/66
U44R7	Y*1(1660) INTO (KBAR N)/(LAMBDA PI)			(P1)/(P2)					
U44R7	0.43	OR MORE		SMITH	63	HBC			
U44R8	Y*1(1660) INTO (SIGMA PI)/(LAMBDA PI)			(P3)/(P2)					
U44R8	0.86			SMITH	63	HBC			
U44R8	6.8	3.0		HUWE	64	HBC	+		
U44R9	Y*1(1660) INTO (LAMBDA PI PI)/(LAMBDA PI)			(P4)/(P2)					
U44R9	0.14			SMITH	63	HBC			
U44R10	Y*1(1660) INTO (Y*0(1405) PI)/(SIGMA PI PI)			(P7)/(P5)					
U44R10	0.90	0.10	0.16	EBERHARD	65				7/66
U44R11	Y*1(1660) INTO (Y*0(1405) PI)/(Y*1(1385) PI)			(P7)/(P6)					
U44R11	0.8	OR MORE		EBERHARD	65				7/66

AUTHOR YR JOURNAL VOL. PAGE AUTHORS // LABORATORIES CODE

$Y^*_0(1405)$

37 Y*0(1405, JP=1/2-) I=0

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
ALSTON	61	PRL 6 698	+ALVAREZ,EBERHARD,GOOD,GRAZIANO, + //LRL	I	U37
ALEXANDE	62	PRL 8 447	ALEXANDER,KALBFLEISCH,MILLER,SMITH //LRL	I	U37
ALSTON	62	CERN CONF 311	+ALVAREZ,FERRO-LUZZI,ROSENFELD, + //LRL	I	U37
MUSGRAVE	65	NC 35 735	+PETMEZAS, + //BRMGH,CERN,EP,IMPCOL,SACLAY		U37
ENGLER	65	PRL 15 224	+FISK,KRAEMER,MELTZER,WESTGARD,+//CRNG,BNL	IJ	U37
KIM	65	PRL 14 29	J K KIM //COLUMBIA	IJP	U37
SAKITT	65	PR 139 B719	+DAY,GLASSER,SEEMAN,FRIEDMAN, + //MD,LRL	IJP	U37
KITTEL	66	PL 21 349	W KITTEL, G OTTER, I WACEK //VIENNA	IJP	U37

PAPER NOT REFERRED TO IN DATA CARDS.

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
ABRAMS	65	PR 139 B454	G S ABRAMS, B SECHI-ZORN //MD	IJP	U37

$Y^*_0(1520)$

38 Y*0(1520, JP=3/2-) I=0

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
WATSON	63	PR 131 2248	M B WATSON, M FERRO-LUZZI, R D TRIPP //LRL	IJP	U38
GALTIERI	63	PL 6 296	A BARBARO-GALTIERI,A HUSSAIN,RD TRIPP//LRL		U38
ALMEIDA	64	PL 9 204	S P ALMEIDA, G R LYNCH //CERN		U38
MUSGRAVE	65	NC 35 735	+PETMEZAS,+//BIRMGHM,CERN,EP,IMPCOL,SACLAY		U38
ARMENTER	65	PL 19 338	ARMENTEROS, + //CERN,HEIDELBERG,SACLAY	IJP	U38

$Y^*_0(1670)$

40 Y*0(1670, JP=1/2-) I=0

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
YUNG-CHA	64	DUBNA CONF I 615	YUNG-CHANG, IN, KLADNITSKAYA, + //DUBNA	I	U40
BERLEY	65	PRL 15 641	+CONNOLLY,HART,RAHM,STONEHILL, + //BNL	IJP	U40

$Y^*_0(1815)$

39 Y*0(1815, JP=5/2+) I=0

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
GALTIERI	63	PL 6 296	A BARBARO-GALTIERI,A HUSSAIN,RD TRIPP//LRL	IJ	U39
BIRGE	65	ATHENS CONF 296	+ELY,KALMUS,KERNAN,LOUIE,SAHOURIA, + //LRL	IJP	U39
TRIPP	66	64(REV) VARENNA	R D TRIPP //REVIEW OF CERN DATA	IJP	U39

PAPERS NOT REFERRED TO IN DATA CARDS.

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
CHAMBERL	62	PR 125 1696	CHAMBERLAIN,CROWE,KEEFE,KERTH, + //LRL	I	U39
SODICKSO	64	PR 133 B757	SODICKSON,MANNELLI,FRISCH,WAHLIG//MIT(BNL)	J	U39
HOLLEY	65	UCRL-16274 THESIS	W R HOLLEY //LRL	J	U39

$Y^*_0(2110)$

41 Y*0(2110, JP=7/2-) I=0

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
BOCK	65	PL 17 166	+COOPER,FRENCH,KINSON, + //CERN,SACLAY		U41
COOL	66	PRL 16 1228	+GIACOMELLI,KYCIA,LEONTIC,LI,LUNDBY,+//BNL	I	U41
WOHL	66	PRL 17 107	C G WOHL, F T SOLMITZ, M L STEVENSON //LRL	IJP	U41

$Y^*_0(2340)$

42 Y*0(2340, JP=) I=0

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
COOL	66	PRL 16 1228	+GIACOMELLI,KYCIA,LEONTIC,LI,LUNDBY,+//BNL	I	U42

$Y^*_1(1385)$

43 Y*1(1385, JP=3/2+) I=1

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
ALSTON	60	PRL 5 520	+ALVAREZ,EBERHARD,GOOD,GRAZIANO, + //LRL	I	U43
DAHL	61	PRL 6 142	+HORWITZ,MILLER,MURRAY,WHITE //LRL		U43
MARTIN	61	PRL 6 283	+LEIPUNER,CHINOWSKY,SHIVELY, + //BNL,YALE		U43
BERGE	61	PRL 6 557	+BASTIEN,DAHL,FERRO-LUZZI,KIRZ, + //LRL		U43
BASTIEN	61	PRL 6 702	P BASTIEN,M FERRO-LUZZI,A H ROSENFELD//LRL		U43
ELY	61	PRL 7 461	+FUNG,GIDAL,PAN,POWELL,WHITE //LRL	J	U43
ALSTON	62	CERN CONF 311	+ALVAREZ,FERRO-LUZZI,ROSENFELD, + //LRL		U43
COLLEY	62	PR 128 1930	+GELFAND,NAUENBERG, + //COLUMBIA,RUTGERS	JP	U43
CURTIS	63	PR 132 1771	+COFFIN,MEYER,TERWILLIGER //MICH	J	U43
FOELSCHE	64	DUBNA CONF	+LOPEZ-CEPERO, + //BNL		U43
COOPER	64	PL 8 365	+FILTHUTH,FRIDMAN,MALAMUD, + //CERN,AMSTR		U43
HUWE	64	UCRL-11291 THESIS	D O HUWE //LRL	JP	U43
MUSGRAVE	65	NC 35 735	+PETMEZAS, + //BRMGH,CERN,EP,IMPCOL,SACLAY		U43
ARMENTER	65	PL 19 75	ARMENTEROS, + //CERN,HEIDEL,SACLAY		U43
BALTAY	65	PR 140 B1027	+SANDWEISS,TAFT,CULWICK,KOPP, + //YALE,BNL		U43
LONDON	66	PR 143 1034	+RAU,SAMIOS,YAMAMOTO,GOLDBERG,+ //BNL,SYCR	J	U43

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS.

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
SHAFER	63	PRL 10 179	J B SHAFER, J J MURRAY, D O HUWE //LRL	JP	U43
SHAFER	64	PR 134 B1372	J B SHAFER, D O HUWE //LRL	JP	U43
MALAMUD	64	PL 10 145	E MALAMUD, P E SCHLEIN //CERN,UCLA	JP	U43

$Y^*_1(1660)$

44 Y*1(1660, JP=3/2) I=1

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
ALEXANDE	62	CERN CONF 320	ALEXANDER,JACOBS,KALBFLEISCH,MILLER,+//LRL	I	U44
ALVAREZ	63	PRL 10 184	+ALSTON,FERRO-LUZZI,HUWE, + //LRL	I	U44
BASTIEN2	63	UCRL-10779 THESIS	P L BASTIEN //LRL	IJ	U44
SMITH	63	ATHENS CONF 67	G A SMITH //LRL		U44
HUWE	64	UCRL-11291 THESIS	D O HUWE //LRL		U44
BERLEY	64	DUBNA CONF I 565	+CONNOLLY,HART,RAHM,STONEHILL, + //BNL	IJP	U44
EBERHARD	65	PRL 14 466	+SHIVELY,ROSS,SIEGAL,FICENEC, + //LRL,ILL	I	U44
LEVEQUE	65	PL 18 69	+ //SACLAY,EP,GLASGOW,IMPCOL,OXF,RTHFD	JP	U44
LONDON	66	PR 143 1034	+RAU,SAMIOS,YAMAMOTO,GOLDBERG,+ //BNL,SYCR	IJ	U44
SMART	66	PRL (SUBMITTED)	W M SMART,A KERNAN,G E KALMUS,R P ELY//LRL	IJP	U44

PAPERS NOT REFERRED TO IN DATA CARDS.
(BASTIEN 1 IS REPLACED BY BASTIEN 2.)
(OTHERS ARE SPIN-PARITY DETERMINATIONS. THE PARITY DETERMINATIONS HERE AND ABOVE ARE NOT ALL IN AGREEMENT.)

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES		CODE
BASTIEN1	63	PRL 10 188	P L BASTIEN, J P BERGE //LRL	IJ	U44
T-ZADEH	63	PRL 11 470	TAHER-ZADEH,PROWSE,SCHLEIN,SLATER,+ //UCLA	JP	U44
EBERHARD	65	BAPS 10 478	P EBERHARD //LRL	IJP	U44
LEE	66	PRL 17 45	Y Y LEE, D D REEDER, R W HARTUNG //WISC	JP	U44

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CODE    EVENTS QUANTITY  ERROR+  ERROR-  REFERENCE YR TECN SIGN COMMENTS     DATE
  ABOVE BACKGROUND                                                         PUNCHED
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Y_1^* (1765)

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45  Y*1(1760, JP=5/2-) I=1

45  Y*1(1760) MASS (MEV)    ------------------------------

U45M           1765.0    10.0          GALTIERI  63 DBC  0  INVM(K-P)
U45M           1755.0    10.0          ARMENTERO 65 HBC  0  K-P TC Y*1520 PI   7/66
U45M           1760.0    10.0          BELL 1,2  66 DBC  -  K-N TC Y*1520 PI   7/66
U45M           1760.0    10.0          TRIPP     66 HBC  C  K-P EL, CH EX      7/66
U45M    *      1755.0       APPROX.    UHLIG     66 HBC  C  SEVERAL CHANNELS   7/66
U45M           1776.0     6.0          SMART     66 DBC  -  K-N TC LAM PI-     7/66

-------------------   45  Y*1(1760) WIDTH (MEV)    ------------------------------

U45W             60.0    10.0          GALTIERI  63 DBC  0  IM(K-P),K-P RVUE
U45W            105.0    20.0          ARMENTERO 65 HBC  0  K-P TC Y*1520 PI   7/66
U45W             70.0    20.0          BELL 2    66 DBC  -  K-N TC Y*1520 PI   7/66
U45W             90.0    10.0          TRIPP     66 HBC  C  K-P EL, CH EX      7/66
U45W            129.0    16.0          SMART     66 DBC  -                     7/66

-------------------   45  Y*1(1760) PARTIAL DECAY MODES    --------------------

U45P1          Y*1(1760) INTO KBAR N                       S11S17
U45P2          Y*1(1760) INTO LAMBDA PI                    S18S 9
U45P3          Y*1(1760) INTO SIGMA PI                     S20S 8
U45P4          Y*1(1760) INTO Y*1(1385) PI                 U43S 8
U45P5          Y*1(1760) INTO Y*0(1520) PI                 U38S 8

-------------------   45  Y*1(1760) BRANCHING RATIOS    -----------------------

U45R1          Y*1(1760) INTO (KBAR N)/TOTAL               (P1)/TOTAL
U45R1             0.6                  GALTIERI  63 HBC  0  K-P RVUE
U45R1             0.50                 TRIPP     66 HBC  C  K-P EL, CH EX      7/66

U45R2          Y*1(1760) INTO (KBAR N)/(RATES 1+2+4+5)     (P1)/(P1+P2+P4+P5)
U45R2             0.52      0.09       UHLIG     66 HBC  C  K-P CH EX          7/66

U45R3          Y*1(1760) INTO (LAMBDA PI)/TOTAL            (P2)/TOTAL
U45R3             0.16                 TRIPP     66 HBC  0  K-P TC LAM PI      7/66
U45R3             0.14      0.02       SMART     66 DBC  -  ASSUMING R1=0.5    7/66

U45R4          Y*1(1760) INTO (LAMBDA PI)/(RATES 1+2+4+5)  (P2)/(P1+P2+P4+P5)
U45R4             0.17      0.02       UHLIG     66 HBC  0  K-P TC LAM PI      7/66

U45R5          Y*1(1760) INTO (SIGMA PI)/TOTAL             (P3)/TOTAL
U45R5             0.03      OR LESS    TRIPP     66 HBC  0  K-P TC SIGMA PI    7/66

U45R6          Y*1(1760) INTO (SIGMA PI)/(RATES 1+2+4+5)   (P3)/(P1+P2+P4+P5)
U45R6             0.16      OR LESS    UHLIG     66 HBC  0  K-P TC SIGMA PI    7/66

U45R7          Y*1(1760) INTO (Y*1(1385)+PI)/TOTAL         (P4)/TOTAL
U45R7             0.10                 TRIPP     66 HBC  C  K-P TC Y*1385 PI   7/66

U45R8          Y*1(1760) INTO (Y*1(1385)+PI)/(RATES 1+2+4+5) (P4)/(P1+P2+P4+P5)
U45R8             0.13      0.05       UHLIG     66 HBC  0  K-P TC Y*1385 PI   7/66

U45R9          Y*1(1760) INTO (Y*0(1520)+PI)/TOTAL         (P5)/TOTAL
U45R9             0.15      0.03       ARMENTERO 65 HBC     K-P TC Y*1520 PI   7/66

U45R10         Y*1(1760) INTO (Y*0(1520)+PI)/(RATES 1+2+4+5) (P5)/(P1+P2+P4+P5)
U45R10            0.17      0.02       UHLIG     66 HBC  0  K-P TC Y*1520 PI   7/66

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Y_1^* (1915)

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46  Y*1(1915, JP=    ) I=1

46  Y*1(1915) MASS (MEV)    ------------------------------

U46M    *      1942.0     9.0          BOCK      65 HBC     PBAR P TO YBAR Y
U46M           1915.0    20.0          COOL      66 CNTR    K-P, D TOTAL       7/66

-------------------   46  Y*1(1915) WIDTH (MEV)    ------------------------------

U46W    *        36.0    20.0    36.0  BOCK      65 HBC
U46W             65.0                  COOL      66 CNTR                       7/66

-------------------   46  Y*1(1915) PARTIAL DECAY MODES    --------------------

U46P1          Y*1(1915) INTO KBAR N                       S11S17
U46P2          Y*1(1915) INTO LAMBDA PI                    S18S 8
U46P3          Y*1(1915) INTO KBAR N PI                    S11S17S 8

-------------------   46  Y*1(1915) BRANCHING RATIOS    -----------------------

U46R1          Y*1(1915) INTO (KBAR N)/TOTAL               (P1)/TOTAL
U46R1             0.103                COOL      66 CNTR    ASSUMING J=5/2     7/66

U46R2          Y*1(1915) INTO (LAMBDA PI)/TOTAL            (P2)/TOTAL
U46R2             0.12      0.08       SMART     66 DBC  -  ASSUMING R1=0.10   7/66

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Y_1^* (2035)

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47  Y*1(2035, JP=7/2+) I=1

47  Y*1(2035) MASS (MEV)    ------------------------------

U47M    *      2022.0    20.0          BLANPIED  65 CNTR C  GAMMA P TO K+ Y*
U47M           2040.0    20.0          COOL      66 CNTR C  K-P TOTAL          7/66
U47M           2030.0    20.0          WOHL      66 HBC  0  K-P TC LAM PIO     7/66

-------------------   47  Y*1(2035) WIDTH (MEV)    ------------------------------

U47W    *       120.0    20.0          BLANPIED  65 CNTR 0  GAMMA P TC K+ Y*
U47W            150.0                  COOL      66 CNTR C  K-P TOTAL          7/66
U47W            170.0                  WOHL      66 HBC  C  K-P TC LAM PIO     7/66

-------------------   47  Y*1(2035) PARTIAL DECAY MODES    --------------------

U47P1          Y*1(2035) INTO KBAR N                       S11S17
U47P2          Y*1(2035) INTO LAMBDA PI                    S18S 9
U47P3          Y*1(2035) INTO SIGMA PI                     S20S 8

-------------------   47  Y*1(2035) BRANCHING RATIOS    -----------------------

U47R1          Y*1(2035) INTO (KBAR N)/TOTAL               (P1)/TOTAL
U47R1             0.155                COOL      66 CNTR C  K-P TOTAL          7/66
U47R1             0.25                 WOHL      66 HBC  C  K-P CH EX          7/66

U47R2          Y*1(2035) INTO (LAMBDA PI)/TOTAL            (P2)/TOTAL
U47R2             0.16                 WOHL      66 HBC  C  ASSUMING R1=0.25   7/66

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Y_1^* (2260)

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48  Y*1(2260, JP=    ) I=1
        EVIDENCE GOOD BUT NOT OVERWHELMING.
        OMITTED FROM TABLE.

48  Y*1(2260) MASS (MEV)    ------------------------------

U48M    *      2245.0                  BLANPIED  65 CNTR    GAMMA P TC K+ Y*
U48M    *      2299.0     6.0          BOCK      65 HBC     PBAR P TO YBAR Y
U48M           2260.0    20.0          COOL      66 CNTR    K-P, D TOTAL       7/66

-------------------   48  Y*1(2260) WIDTH (MEV)    ------------------------------

U48W    *       150.0                  BLANPIED  65 CNTR
U48W    *        21.0    17.0    21.0  BOCK      65 HBC
U48W            180.0                  COOL      66 CNTR                       7/66

-------------------   48  Y*1(2260) PARTIAL DECAY MODES    --------------------

U48P1          Y*1(2260) INTO KBAR N                       S11S17
U48P1          Y*1(2260) INTO KBAR N PI                    S11S17S 8

-------------------   48  Y*1(2260) BRANCHING RATIOS    -----------------------

U48R1          Y*1(2260) INTO (KBAR N)/TOTAL               (P1)/TOTAL
U48R1             0.14                 COOL      66 CNTR    ASSUMING J=9/2     7/66

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```

Ξ* (1530)

```
49  XI*1/2(1530, JP=3/2+) I=1/2

49  XI*1/2(1530) MASS (MEV)    ---------------------------
  (* ONLY UNSTARRED DATA -- CAREFUL ATTEMPTS TO
  OBTAIN SEPARATE CHARGE-STATE MASSES -- ARE USED.)

U49M    *      1529.0     5.0          PJERROU   62 HBC  C-
U49M    *      1532.0     2.0          BADIER    64 HBC  0-
U49M-          1535.7     3.2          LONDON    66 HBC  -                     7/66
U49M0          1528.7     1.1          LONDON    66 HBC  C                     7/66

-------------------   49  XI*(-)-XI*(0) MASS DIFFERENCE (MEV)    --------------

U49D              4.5     2.3          PJERROU   65 HBC  C-                    7/66
U49D              7.0     4.0          LONDON    66 HBC  0- SEE MASS CARDS     7/66
U49D              2.0     3.2          MERRILL   66 HBC  0-                    7/66

-------------------   49  XI*1/2(1530) WIDTH (MEV)    --------------------------

U49W              7.0     2.0          SCHLEIN   63 HBC  0
U49W              8.5     3.5          LONDON    66 HBC  C                     7/66
U49W              7.0     7.0          BERGE     66 HBC  C                     7/66

-------------------   49  XI*1/2(1530) PARTIAL DECAY MODES    ----------------

U49P1          XI*1/2(1530) INTO XI PI                     S22S 8

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```

Ξ* (1705)

```
51  XI*1/2(1705, JP=    ) I=1/2
 EVIDENCE NOT COMPELLING.  OMITTED FROM TABLE.

51  XI*1/2(1705) MASS (MEV)    ---------------------------

U51M           1705.0       APPROX     SMITH     65 HBC  0- INVM(XIPI,LAMK)

-------------------   51  XI*1/2(1705) WIDTH (MEV)    --------------------------

U51W             20.0       APPROX     SMITH     65 HBC  0- INVM(XIPI,LAMK)

-------------------   51  XI*1/2(1705) PARTIAL DECAY MODES    ----------------

U51P1          XI*1/2(1705) INTO XI PI                     S22S 8
U51P2          XI*1/2(1705) INTO LAMBDA KBAR               S18S11

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-------------------------------------------------------------------------------
```

Ξ* (1820)

```
50  XI*1/2(1820, JP=    ) I=1/2

50  XI*1/2(1820) MASS (MEV)    ---------------------------

U50M    *      1770.0                  HALSTEINS 63 FBC  C- INVM(XI- PI+,0)
U50M           1817.0     7.0          SMITH 1   65 HBC  0- INVM(LAM K-,0)
U50M           1814.0     4.0          BADIER    65 HBC  C  INVM(LAM KO)

-------------------   50 XI*1/2(1820) WIDTH (MEV)    ---------------------------

U50W    *        80.0       OR LESS    HALSTEINS 63 FBC  0- INVM(XI- PI+,0)
U50W             12.0     4.0          BADIER    65 HBC  C  INVM(LAM KO)
U50W             30.0     7.0          SMITH 2   65 HBC  C- INVM(LAM K-,0)

-------------------   50  XI*1/2(1820) PARTIAL DECAY MODES    ----------------

U50P1          XI*1/2(1820) INTO LAMBDA KBAR               S18S11
U50P2          XI*(1820) INTO XI PI                        S22S 8
U50P3          XI*(1820) INTO XI*1/2(1530) PI              U49S 8
U50P4          XI*(1820) INTO XI PI PI (XI PI NOT XI*(1530)) S22S 8S 8

-------------------   50  XI*1/2(1820) BRANCHING RATIOS    -------------------

U50R1          XI*1/2(1820) INTO (LAMBDA KBAR)/TOTAL       (P1)/TOTAL
U50R1   *         LARGE                BADIER    65 HBC                        7/6
U50R1   *         LARGE                SMITH 2   65 HBC                        7/6

U50R2          XI*1/2(1820) INTO (XI PI)/(LAMBDA KBAR)     (P2)/(P1)
U50R2             0.20      0.20       BADIER    65 HBC                        7/6
U50R2   *         SMALL                SMITH 2   65 HBC     IF XI*1933 EXIST   7/6

U50R3          XI*1/2(1820) INTO (XI*(1530) PI)/(LAM KBAR) (P3)/(P1)
U50R3             0.26      0.13       SMITH 1   65 HBC
U50R3   *         SMALL                BADIER    65 HBC                        7/6

U50R4          XI*1/2(1820) INTO (XI PI PI)/(LAMBDA KBAR)  (P4)/(P1)
U50R4             0.1        OR MORE   SMITH 1   65 HBC
U50R4   *         SMALL                BADIER    65 HBC                        7/6

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```

Ξ* (1933)

```
52  XI*1/2(1933, JP=    ) I=1/2

52  XI*1/2(1933) MASS (MEV)    ---------------------------

U52M           1933.0    16.0          BADIER    65 HBC  C  INVM(XI- PI+)

-------------------   52  XI*1/2(1933) WIDTH (MEV)    --------------------------

U52W            140.0    35.0          BADIER    65 HBC  C  INVM(XI- PI+)

-------------------   52  XI*1/2(1933) PARTIAL DECAY MODES    ----------------

U52P1          XI*1/2(1933) INTO XI PI                     S22S 8
U52P2          XI*1/2(1933) INTO LAMBDA KBAR               S18S11

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REFERENCES ON BARYON RESONANCES

```
AUTHOR   YR JOURNAL VOL. PAGE AUTHORS                        // LABORATORIES   CODE
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$Y_1^*(1765)$

```
45  Y*1(1760, JP=5/2-) I=1  --------------------

GALTIERI 63 PL 6 296          A BARBARO-GALTIERI,A HUSSAIN,RD TRIPP//LRL IJ  U45
ARMENTER 65 PL 19 338         ARMENTEROS, +      //CERN,HEIDELBERG,SACLAY IJP U45
BELL 1   66 PRL 16 203        R B BELL, R W BIRGE, Y-L PAN, R T PU //LRL IJP U45
BELL 2   66 UCRL-16936 THESIS R B BELL                            //LRL IJP U45
TRIPP    66 64(REV) VARENNA   R D TRIPP              //REVIEW OF CERN DATA IJP U45
UHLIG    66 PRL (SUBMITTED)   +CHARLTON,CONDON,GLASSER,+//MARYLAND,USNRL IJ  U45
SMART    66 PRL (SUBMITTED)   W M SMART,A KERNAN,G E KALMUS,R P ELY//LRL IJP U45

     PAPERS NOT REFERRED TO IN DATA CARDS.
       (PRECURSORS OF UHLIG 66 AND BELL 66 RESPECTIVELY.)

YODH     65 ATHENS CONF 269   G B YODH                       //MARYLAND IJ  U45
BIRGE    65 ATHENS CONF 296   +ELY,KALMUS,KERNAN,LOUIE,SAHOURIA, + //LRL IJP U45
```

$Y_1^*(1915)$

```
46  Y*1(1915, JP=    ) I=1  ------------------

BOCK     65 PL 17 166         +COOPER,FRENCH,KINSON, +      //CERN,SACLAY  I  U46
COOL     66 PRL 16 1228       +GIACOMELLI,KYCIA,LEONTIC,LI,LUNDBY,+//BNL  I  U46
SMART    66 PRL (SUBMITTED)   W M SMART,A KERNAN,G E KALMUS,R P ELY//LRL IJP U46
```

$Y_1^*(2035)$

```
47  Y*1(2035, JP=7/2+) I=1  -------------------

BLANPIED 65 PRL 14 741        +GREENBERG,HUGHES,KITCHING,LU,+//YALE(CEA)     U47
COOL     66 PRL 16 1228       +GIACOMELLI,KYCIA,LEONTIC,LI,LUNDBY,+//BNL  I  U47
WOHL     66 PRL 17 107        C G WOHL, F T SOLMITZ, M L STEVENSON //LRL IJP U47

     QUANTUM NUMBER DETERMINATION NOT REFERRED TO IN DATA CARDS.

SMART    66 PRL (SUBMITTED)   W M SMART,A KERNAN,G E KALMUS,R P ELY//LRL IJP U47
```

$Y_1^*(2260)$

```
48  Y*1(2260, JP=    ) I=1  --------------------

BLANPIED 65 PRL 14 741        +GREENBERG,HUGHES,KITCHING, +  //YALE(CEA)     U48
BOCK     65 PL 17 166         +COOPER,FRENCH,KINSON, +      //CERN,SACLAY    U48
COOL     66 PRL 16 1228       +GIACOMELLI,KYCIA,LEONTIC,LI,LUNDBY,+//BNL  I  U48
```

$\Xi^*(1530)$

```
49  XI*1/2(1530, JP=3/2+) I=1/2  --------------

PJERROU  62 PRL 9 114         +PROWSE,SCHLEIN,SLATER,STORK,TICHO  //UCLA  I  U49
SCHLEIN  63 PRL 11 167        +CARMONY,PJERROU,SLATER,STORK,TICHO //UCLA IJP U49
BADIER   64 DUBNA I 593       +DEMOULIN,GOLDBERG, +     //EP,SACLAY,AMSTR  I  U49
PJERROU  65 PRL 14 275        +SCHLEIN,SLATER,SMITH,STORK,TICHO   //UCLA     U49
LONDON   66 PR 143 1034       +RAU,SAMIOS,YAMAMOTO,GOLDBERG,+ //BNL,SYCR  IJ U49
BERGE    66 PR  (ACCEPTED)    +EBERHARD,HUBBARD,MERRILL,B-SHAFER,+ //LRL  I  U49
MERRILL  66 UCRL-16455 THESIS D W MERRILL                        //LRL  JP U49

     PAPERS NOT REFERRED TO IN DATA CARDS.
          (LONDON 66 REPLACES BERTANZA 62.)
          (SHAFER 66 IS A JP DETERMINATION.)

BERTANZA 62 PRL 9 180         +BRISSON,CONNOLLY,HART,MITTRA,+ //BNL,SYCR  I  U49
SHAFER   66 PR 142 883        BUTTON-SHAFER,LINDSEY,MURRAY,SMITH  //LRL  JP U49
```

$\Xi^*(1705)$

```
51  XI*1/2(1705, JP=    ) I=1/2  ------------

SMITH    65 ATHENS CONF 251   G A SMITH, J S LINDSEY                //LRL  I  U51
```

$\Xi^*(1820)$

```
50  XI*1/2(1820, JP=    ) I=1/2  --------------

HALSTEIN 63 SIENA CONF 173    HALSTEINSLID,+//BERGEN,CERN,EP,RTHF,UNICOL  I  U50
SMITH 1  65 PRL 14 25         +LINDSEY,BUTTON-SHAFER,MURRAY         //LRL IJP U50
BADIER   65 PL 16 171         +DEMOULIN,GOLDBERG, +     //EP,SACLAY,AMSTR  I  U50
SMITH 2  65 ATHENS CONF 251   G A SMITH, J S LINDSEY                //LRL     U50
```

$\Xi^*(1933)$

```
52  XI*1/2(1933, JP=    ) I=1/2  ------------

BADIER   65 PL 16 171         +DEMOULIN,GOLDBERG, +      //EP,SACLAY,AMST  I  U52
```

Notes on Stable Particles (UCRL-8030, Aug. 1966)

Charged pion lifetime (Roos, April 1966)

The recent precision measurements by ECKHAUSE+ 65 and KINSEY+ 66 are in disagreement with older data and in violent disagreement with each other. As long as the reason for this situation is not understood we choose to tabulate a slight modification of the value of Eckhause+ (which is intermediate between the old value and the value of Kinsey+). The modification arises from discussions with Siegel (of Eckhause+) on the systematic error introduced by a given choice of early cutoff time, and it amounts to increasing the value of Eckhause+ by 0.01 nsec and doubling the error. (We have modified only the table, not the data card.)

Charged pion branching ratio into $\pi^0 e\nu$ (Roos, April 1966)

The Depommier+ value has not been combined with earlier values because of a systematic error, which has been taken into account by Depommier+ in their present evaluation, but which has been neglected by all groups previously (V. Soergel, private communication). This procedure may further be justified by the fact that the weighted mean (WM) of all other measurements has a larger error than the single measurement by DEPOMMIER+ 66 (D), and that the possible bias is consistent with zero, i.e.,

$$WM - D = (0.045 \pm 0.14)10^{-8}.$$

Neutral pion lifetime (Roos, April 1966)

Since the group of emulsion measurements disagree largely with the two much shorter lifetimes by VON DARDEL+ 63 and by BELLETTINI+ 65 (who used different counter techniques), we have taken this as and indication that the emulsion measurements perhaps define only an upper limit. The table lists the weighted, scaled mean of the values of VON DARDEL+ 63 and BELLETTINI+ 65.

Eta decay into neutrals (Price, Barbaro-Galtieri, Aug. 1966)

In HBC and DBC experiments reporting the mode $\eta \rightarrow 3\pi^0$, the mode $\eta \rightarrow \pi^0 2\gamma$ is also included (as well as the mode $\eta \rightarrow 2\pi^0\gamma$, if it exists). Since the detection efficiencies are different for the various modes, one may not merely substitute the combined rate ($3\pi^0 + \pi^0 2\gamma$) for the reported $3\pi^0$ rate in these experiments. MULLER+ 63 (DBC) state that their detection efficiency per γ ray is about the same regardless of the mode of decay ($3\pi^0$ or $\pi^0 2\gamma$). CRAWFORD2 66 (HBC) has shown that the same is true for the HBC experiments listed. Thus for all these experiments (assuming $\eta \rightarrow 2\pi^0\gamma$ to be equal to zero)

$$3\pi^0_{\text{true}} = 3\pi^0_{\text{reported}} \times \frac{1}{1 + \frac{4}{6}r} \qquad (1)$$

and

$$\pi^0 2\gamma_{true} = 3\pi^0_{reported} \times \frac{r}{1+\frac{4}{6}r}, \qquad (2)$$

where

$$r = \frac{\pi^0 2\gamma}{3\pi^0}.$$

CRAWFORD2 gives values for $3\pi^0/\pi^+\pi^-\pi^0$, using (1) and assuming $r = 1.79 \pm 0.58$, from DIGIUGNO+ 66 (CNTR). In our programs we have used the formulas (1) and (2) for these experiments, with the parameter "r" determined by the overall fit. The errors of the DIGIUGNO+ 66 experiment have been increased by a factor 2 to take into account possible systematic errors, as suggested by the authors. This has been done because this experiment

(a) does not agree with GRUNHAUS 66 and WAHLIG 66, and
(b) reduces the $3\pi^0/\pi^+\pi^-\pi^0$ ratio even further below the "natural" value of 3/2.

It is hoped that this disagreement will be discussed at the August 1966 Berkeley Conference.

<u>Lambda lifetime</u> (Barbaro-Galtieri, Aug. 1966)

There is a large disagreement between various experiments, so a Gaussian ideogram of the decay rates would show two peaks for this distribution. We have neglected all measurements earlier than 1961. (They have relatively large errors and dilute χ^2.) For the moment, we have chosen to neglect all unpublished measurements, except for those reported in theses. We are then left with 10 determinations of the lambda lifetime.

The five hydrogen bubble chamber measurements agree with each other (no "east-west effect"). The four (HeBC, PBC or FBC) bubble chamber measurements do not agree between themselves, and the same is true for the two spark chamber measurements. At present we have no criteria to choose between the two peaks, so we quote the weighted average, with an error multiplied by the scale factor (S = 1.6). This is a temporary and surely inadequate solution.

Notes on Meson Resonances (UCRL-8030, Aug. 1966)

The κ(725) (Lynch, Rosenfeld, Aug. 1966)

We are beginning to think that κ should be classified along with flying saucers, the Loch Ness Monster, and the Abominable Snow Man. We have heard of several experiments which were supposed to confirm it, and each one has either failed completely or failed to find it in the sought-for channel and found instead a small $K\pi$ peak near 725 MeV in some other channel.

Like flying saucers, the κ will be hard either to confirm or deny. We should collect all the data we can at the Berkeley Conference and then compile them.

We have stopped punching data cards, although, out of inertia, a few up-to-date ones have been added to the deck.

Below are some partially documented notes from our Kappa dossier.

The κ was first reported at LRL by ALEXANDER+ 62 and MILLER+ 63 in the reaction 1.5- to 2.4-GeV/c $\pi^- p \rightarrow \Sigma^-\pi^+K^0$. As more of these events have been accumulated by the same group, the effect has diminished, and this experiment no longer has significant evidence for the κ.[1]

The second experiment to report the κ was that of WOJCICKI+ 63, who studied about 4000 events of the reaction $K^-p \rightarrow K^0\pi^+p$. In agreement with the original κ evidence, their κ had a mass of 723 ± 3 MeV and a width of <12 MeV. Wojcicki's largest effect was at 1.08 BeV/c. The CERN-SACLAY K^- collaboration[2] has more data than Wojcicki at this momentum, and they see a valley in the κ region, thus washing out Wojcicki's effect. They do, however, report evidence for κ when the beam is tuned below the K^* threshold.

A comparable experiment at LRL[3] at the same momenta as the CERN experiment sees no evidence for the κ either above or below the K^* threshold.

Furthermore, more than 10 000 events of the types $K^-p \rightarrow K^-p\pi^0$ and $K^-n\pi^+$ have now been examined at LRL in the same film as Wojcicki used, and no significant κ effect is observed.[4] This same reaction has been studied at LRL at higher momenta, and again in 8000 events from 2.1 to 2.7 BeV/c no κ is observed.[5]

The κ was also reported by London et al.[6] in 413 events of the reaction 2.0-GeV/c $K^-p \rightarrow \Xi\pi K$. The κ that they saw was at 730 MeV and <15 MeV wide. Recent data at UCLA[7] at a nearby momentum (2.0 rather than 2.24 GeV/c) finds no evidence in this reaction for a resonance at 725 MeV. (They do have a peak at 700 MeV, however.)

A fourth experiment to report the κ was a CERN experiment of Ferro-Luzzi et al.[8] who saw an effect in the reaction $K^+p \rightarrow NK\pi\pi\pi$. This κ was at 725 MeV and had a width of about 40 MeV. This effect was found in the 3-BeV/c data, but was absent in the 3.5-GeV/c data. An experiment at Wisconsin[9] at 3.6 GeV/c with three times as many events as the CERN experiment also saw no evidence for a κ.

Evidence for the κ was reported by KIM 65 in the reaction $\pi^- p \rightarrow K^0 \Lambda \pi^0$. An LRL experiment[1] with more events does not see a significant peak at the κ mass.

There have also been other experiments that have looked for the κ. The CERN K^+ group[10] looked for the κ below K^* threshold in the reaction $K^+ p \rightarrow K^0 \pi^+ p$, and saw none. In the reaction $K^- p \rightarrow KN\pi\pi$, Wojcicki et al.[11] see a small κ effect at 725 MeV. Other large experiments[5, 7, 12] (all at higher momentum) see no effect at 725 MeV.

The κ seems dead; long live the κ.

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1. Lynn Hardy (Ph. D. thesis), UCRL-16788, July 1966.
2. Riccardo Levi-Setti (Chicago), private communication.
3. George Kalmus (LRL), private communication.
4. Gerald Lynch (LRL), private communication.
5. Jeremy Friedman (LRL), private communication.
6. G. W. London et al., Phys. Rev. 143, 1034 (1966), includes the data of CONNOLLY+ 63.
7. Philip Dauber (UCLA), private communication.
8. Massimiliano Ferro-Luzzi et al., Phys. Letters 12, 255 (1964).
9. William D. Walker (reported at Athens, 1965).
10. Victor Henri (CERN), private communication.
11. Stanley G. Wojcicki et al., Phys. Rev. 135, B495 (1964).
12. Morris Pripstein (LRL), private communication.

$K\bar{K}_1 \rightarrow \eta\pi$ (Rosenfeld, Aug. 1966)

The $I = 1$ $\bar{K}K$ enhancement has been seen only in $\bar{p}p$ annihilations, where no $\eta\pi$ mass spectra are known to us. There are $\eta\pi$ spectra in $\pi^- p$ interactions [see Alitti et al., Phys. Letters 15, 69 (1965)], but there the total production of KK_1 is ≤ 3 μb at 3.1 GeV/c [see Richard I. Hess (Ph. D. Thesis, UCRL-16832, June 1966), submitted Aug. 1966 to Phys. Rev. Letters].

Notes on Baryon Resonances (UCRL-8030, Aug. 1966)

Mass and width assignments for the lowest eight N^*'s (Rosenfeld, Aug. 66)

The M and Γ values were assigned by inspection of the Argand diagrams of BAREYRE+ 65, as drawn in the attached Fig. 1. We chose the solutions of Bareyre et al. merely because they gave complete sets of phase shifts for all eight probable resonances. Other analyses do not necessarily agree, and in fact the S-wave amplitudes may not resonate at all!

We looked at Fig. 1 and tried to choose a value of M for which the amplitude was changing fast and seemed to be half-way around a roughly circular trajectory. We chose Γ/2 at a place where the "velocity" seems to have dropped to 1/2.

The basis for this criterion is the following: If the trajectory is simply the pure Breit-Wigner resonant circle,

$$T = \frac{1}{\epsilon - i}, \qquad (1)$$

where $\epsilon = (M-E)/(\Gamma/2)$, it is simple to show that its "velocity" is

$$\left|\frac{d\vec{T}}{d\epsilon}\right| = \frac{1}{1+\epsilon^2} = \mathrm{Im}\,(T), \qquad (2)$$

and so should be a maximum at the top, and should fall to 1/2 by one half-width away from resonance. A fair example of (2) is the $\Delta(1236, P_{33})$ trajectory, which seems to behave as predicted up to about 1260 MeV.

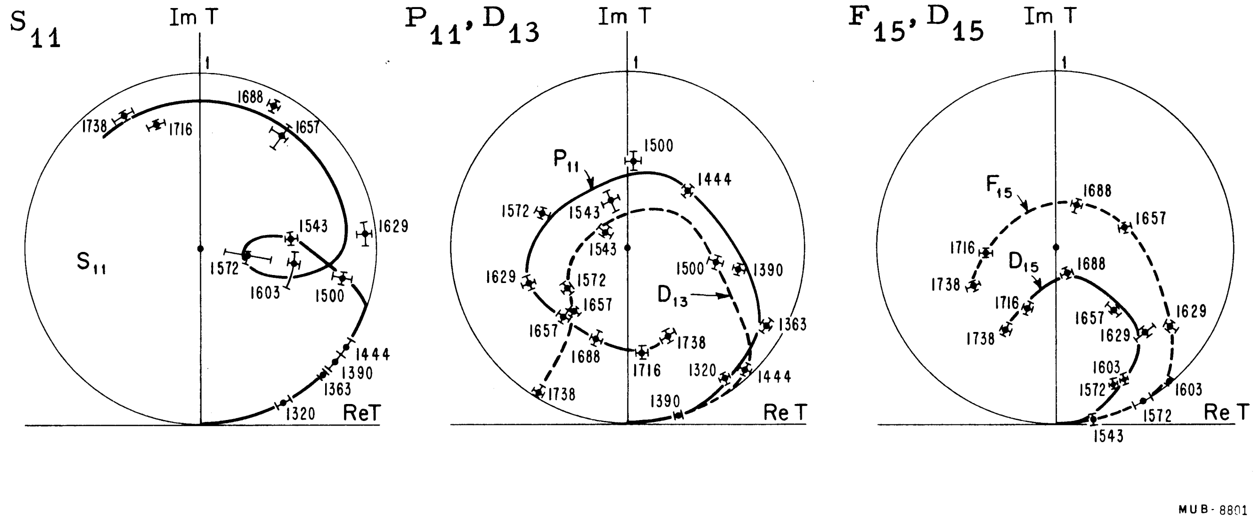
In general a resonance will be superimposed on a "slowly varying" background amplitude b, and will have the form

$$T = b + \frac{x\, e^{2i\delta_b}}{\epsilon - i}, \qquad (1')$$

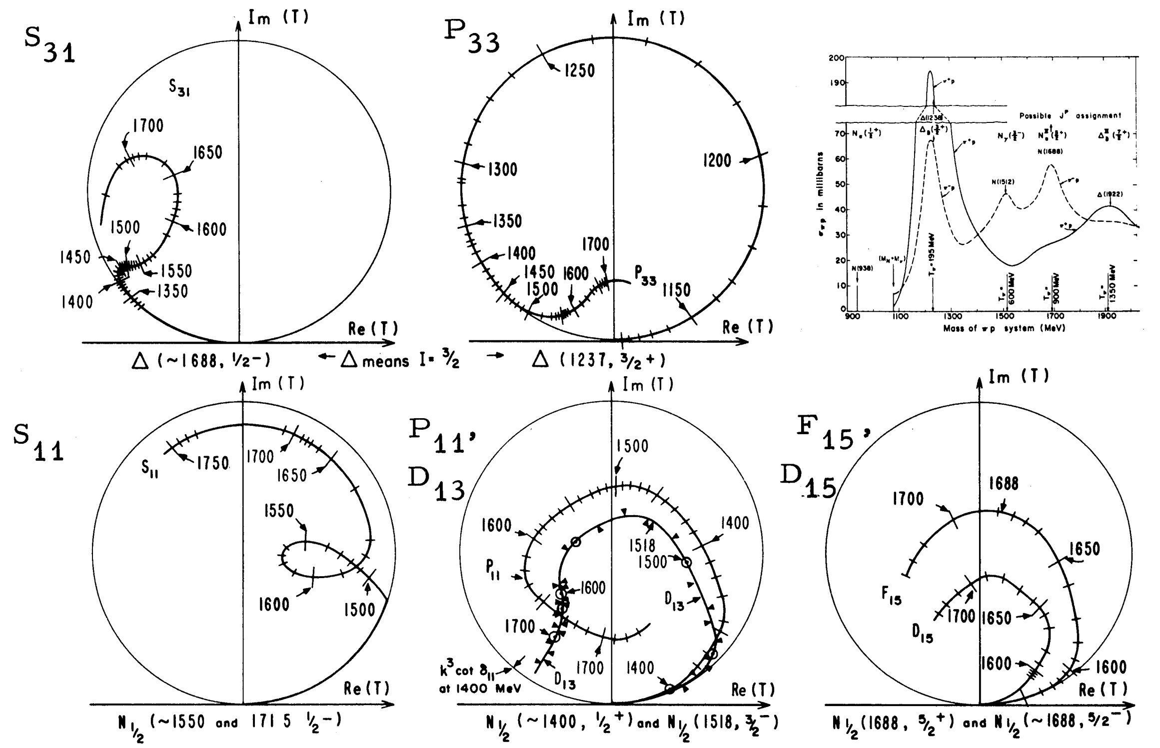
where $x \leq 1$ is the elasticity, and $e^{2i\delta_b}$ is the result of background, and rotates the resonant circle so as to keep it within the unitarity circle. Despite these complications, the velocity equation (2) will still be

$$\left|\frac{d\vec{T}}{d\epsilon}\right| = \frac{x}{1+\epsilon^2}. \qquad (2')$$

Hence the maximum velocity seems to be a simple local criterion for choosing the mass of a resonance; for a single Breit-Wigner resonance it is actually correct, for two adjacent coupled resonances it is not correct (in fact inspection of Fig. 1 shows an indeterminancy of ≈100 MeV in several cases), but it is still a useful extra criterion to weigh into the choice, and has the advantage that one can read off an arbitrary answer without understanding the assumptions that go into a complicated fit.



Solutions of Bareyre et al. to I-spin 1/2 resonant partial waves. The crosses show the amplitudes and errors computed from the data at various energies. The smooth connecting lines are guesses.



The smooth guessed curves above are replotted with the actual calculated amplitudes replaced by hatch marks interpolated every 10 MeV. For a resonance they should be spaced proportionally to $\mathrm{Im}(T) = (1+\epsilon^2)^{-1}$. The I-spin 3/2 resonant partial waves have been added at the top, along with a summary of the total cross section for π^+p and π^-p.

MUB-8801-A

Fig. 1

In order to help other readers make such visual fits, we should be happy to include in UCRL-8030 figures similar to the cross-hatched part of Fig. 1, if other authors would supply them.

We shall now consider each of the first eight resonances in turn. For a more detailed discussion see R. D. Tripp, Proc. 1966 Varenna Summer School, Course 33 (Academic Press, 1966), or A. H. Rosenfeld, UCRL-16968,

N(1400, $1/2^+ = P_{11}$).

The P_{11} amplitude starts off negative (repulsive force), then turns around and crosses the origin at a mass 1175 MeV. It seems to reach a maximum velocity even below 1400 MeV. Let us consider the P_{11} amplitude to be the result of two opposite forces, a repulsive force responsible for a negative scattering length A, and an attractive resonant interaction. The scattering length will produce a phase shift $2i\delta'$ and a contribution to the T' matrix

$$T' = \frac{e^{2i\delta'}-1}{2i} . \tag{3}$$

The resonant term T will be given by (2), so that the total amplitude, $T'' = T' + T$, will now start out negative, and then superimposed on this clockwise motion will be the counterclockwise circular resonant behavior.

How far around this resonant circle is 1400 MeV? To solve this simple problem, assume that the repulsive phase shift $2\delta'$ is related to a scattering length by

$$k^3 \cot \delta' = 1/A,$$

or more precisely, using McKinley's phase shifts,[1]

$$(k/m_\pi)^3 \cot \delta' = -(.015)^{-1}.$$

Then, at 1400 MeV, δ' has reached -15 deg. We have plotted the corresponding point on Fig. 1. It is encouraging that this point lies almost diametrically across the resonant circle from 1400 MeV. Evidence for this excited nucleon at about 1400 MeV was seen in pp diffraction scattering in 1964 by Cocconi et al.[2] and more recently by Anderson et al.[3]

Note that the velocity seems to increase again at ≈1650 MeV. However, the solution by Brandsen et al.[4] shows no such second maximum, and anyway 1650 seems too far away ($2.5 \times \Gamma/2$) to influence our assignment of $M \approx 1400$ MeV.

$N^{*}_{1/2}(1550,\ 1/2^{-} = S_{11})$, and $(1700,\ 1/2^{-} = S_{11})$

The Bareyre+ trajectory indicates two resonances. It first goes around a small circle centered around ≈ 1570 MeV, and then follows a larger circle with M≈ 1700. The crosshatching on the smaller circle actually shows two velocity maxima, which we take to indicate inadequate input data. Hence our local criterion of maximum velocity fails. To fit the larger picture we have used the result of MICHAEL 66, who has "fitted" (visually!) the solution of Bareyre et al. to two resonant circles plus no background.

$N^{*}(1518,\ 5/2^{-},\ D_{13})$

In the good old days the 600-MeV bump was thought to be a single $3/2^{-}$ resonance of mass 1518 MeV. This old value still seems reasonable, and we continue to use it.

$N^{*}(1688,\ 5/2^{-},\ D_{15})$ and $N^{*}(1688,\ 5/2^{+},\ F_{15})$

The old nominal value of 1688 corresponds to the peak of the "900-MeV bump." Although assigned before it was known that the bump seems to cover three resonances, the value 1688 still seems reasonable for D_{15} and F_{15}. We have discussed S_{11} above.

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