$K_0^*(1430)$

$I(J^P) = \frac{1}{2}(0^+)$

See our minireview in the 1994 edition and in this edition under the $f_0(500)$.

$K_0^*(1430)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
1425 ±50 OUR ESTIMATE						
• • • We do not use the following data for averages, fits, limits, etc. • • •						
1427 ± 4 ±13		[1] BUGG	10	RVUE		S-matrix pole
1466.6± 0.7± 3.4	141k	[2] BONVICINI	08A	CLEO		$D^+ \rightarrow K^- \pi^+ \pi^+$
∼ 1412		[3] LINK	07	FOCS	0	$D^+ \rightarrow K^- K^+ \pi^+$
1461.0± 4.0± 2.1	54k	[4] LINK	07B	FOCS		$D^+ \rightarrow K^- \pi^+ \pi^+$
1406 ±29		[5] BUGG	06	RVUE		
1435 ± 6		[6] ZHOU	06	RVUE		$K p \rightarrow K^- \pi^+ n$
1455 ±20 ±15		ABLIKIM	05Q	BES2		$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$
1456 ± 8		[7] ZHENG	04	RVUE		$K^- p \rightarrow K^- \pi^+ n$
∼ 1419		[8] BUGG	03	RVUE		11 $K^- p \rightarrow K^- \pi^+ n$
∼ 1440		[9] LI	03	RVUE		11 $K^- p \rightarrow K^- \pi^+ n$
1459 ± 9	15k	[10] AITALA	02	E791		$D^+ \rightarrow K^- \pi^+ \pi^+$
∼ 1440		[11] JAMIN	00	RVUE		$K p \rightarrow K p$
1436 ± 8		[12] BARBERIS	98E	OMEG		450 $p p \rightarrow p_f p_s K^+ K^- \pi^+ \pi^-$
1415 ±25		[8] ANISOVICH	97C	RVUE		11 $K^- p \rightarrow K^- \pi^+ n$
∼ 1450		[13] TORNQVIST	96	RVUE		$\pi\pi \rightarrow \pi\pi$, $K\overline{K}$, $K\pi$
1412 ± 6		[14] ASTON	88	LASS	0	11 $K^- p \rightarrow K^- \pi^+ n$
∼ 1430		BAUBILLIER	84B	HBC	−	8.25 $K^- p \rightarrow \overline{K}^0 \pi^- p$
∼ 1425		[15,16] ESTABROOKS	78	ASPK		13 $K^\pm p \rightarrow K^\pm \pi^\pm (n, \Delta)$
∼ 1450.0		MARTIN	78	SPEC		10 $K^\pm p \rightarrow K_S^0 \pi p$

[1] S-Matrix pole. Supersedes BUGG 06. Combined analysis of ASTON 88, ABLIKIM 06C, AITALA 06, and LINK 09 using an s-dependent width with couplings to $K\pi$ and $K\eta'$, and the Adler zero near thresholds.
[2] From the isobar model with a complex pole for the κ.
[3] From a non-parametric analysis.
[4] A Breit-Wigner mass and width.
[5] S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C including the κ with an s-dependent width and an Adler zero near threshold.
[6] S-matrix pole. Using ASTON 88 and assuming $K_0^*(800)$, $K_0^*(1950)$.
[7] Using ASTON 88 and assuming $K_0^*(800)$.
[8] T-matrix pole. Reanalysis of ASTON 88 data.
[9] Breit-Wigner fit. Using ASTON 88.
[10] Assuming a low-mass scalar $K\pi$ resonance, $\kappa(800)$.
[11] T-matrix pole. Using data from ESTABROOKS 78 and ASTON 88.
[12] J^P not determined, could be $K_2^*(1430)$.
[13] T-matrix pole.

[14] Uses a model for the background, without this background they get a mass 1340 MeV, where the phase shift passes 90°.
[15] Mass defined by pole position.
[16] From elastic $K\pi$ partial-wave analysis.

$K_0^*(1430)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
270 ±80 OUR ESTIMATE						
• • • We do not use the following data for averages, fits, limits, etc. • • •						
270 ±10 ±40		[17] BUGG	10	RVUE		S-matrix pole
174.2± 1.9± 3.2	141k	[18] BONVICINI	08A	CLEO		$D^+ \to K^-\pi^+\pi^+$
~ 500		[19] LINK	07	FOCS	0	$D^+ \to K^-K^+\pi^+$
177.0± 8.0± 3.4	54k	[20] LINK	07B	FOCS		$D^+ \to K^-\pi^+\pi^+$
350 ±40		[21] BUGG	06	RVUE		
288 ±22		[22] ZHOU	06	RVUE		$Kp \to K^-\pi^+n$
270 ±45 $^{+30}_{-35}$		ABLIKIM	05Q	BES2		$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$
217 ±31		[23] ZHENG	04	RVUE		$K^-p \to K^-\pi^+n$
~ 316		[24] BUGG	03	RVUE		11 $K^-p \to K^-\pi^+n$
~ 350		[25] LI	03	RVUE		11 $K^-p \to K^-\pi^+n$
175 ±17	15k	[26] AITALA	02	E791		$D^+ \to K^-\pi^+\pi^+$
~ 300		[27] JAMIN	00	RVUE		$Kp \to Kp$
196 ±45		[28] BARBERIS	98E	OMEG		450 $pp \to p_f p_s K^+K^-\pi^+\pi^-$
330 ±50		[24] ANISOVICH	97C	RVUE		11 $K^-p \to K^-\pi^+n$
~ 320		[29] TORNQVIST	96	RVUE		$\pi\pi \to \pi\pi$, $K\overline{K}$, $K\pi$
294 ±23		ASTON	88	LASS	0	11 $K^-p \to K^-\pi^+n$
~ 200		BAUBILLIER	84B	HBC	−	8.25 $K^-p \to \overline{K}^0\pi^-p$
200 to 300		[30] ESTABROOKS	78	ASPK		13 $K^\pm p \to K^\pm\pi^\pm(n,\Delta)$

[17] S-Matrix pole. Supersedes BUGG 06. Combined analysis of ASTON 88, ABLIKIM 06C, AITALA 06, and LINK 09 using an s-dependent width with couplings to $K\pi$ and $K\eta'$, and the Adler zero near thresholds.
[18] From the isobar model with a complex pole for the κ.
[19] From a non-parametric analysis.
[20] A Breit-Wigner mass and width.
[21] S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C including the κ with an s-dependent width and an Adler zero near threshold.
[22] S-matrix pole. Using ASTON 88 and assuming $K_0^*(800)$, $K_0^*(1950)$.
[23] Using ASTON 88 and assuming $K_0^*(800)$.
[24] T-matrix pole. Reanalysis of ASTON 88 data.
[25] Breit-Wigner fit. Using ASTON 88.
[26] Assuming a low-mass scalar $K\pi$ resonance, $\kappa(800)$.
[27] T-matrix pole. Using data from ESTABROOKS 78 and ASTON 88.
[28] J^P not determined, could be $K_2^*(1430)$.
[29] T-matrix pole.
[30] From elastic $K\pi$ partial-wave analysis.

$K_0^*(1430)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$K\pi$	(93 ± 10) %

$K_0^*(1430)$ BRANCHING RATIOS

$\Gamma(K\pi)/\Gamma_{\text{total}}$ **Γ_1/Γ**

VALUE	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
0.93±0.04±0.09	ASTON	88	LASS	0	11 $K^- p \to K^- \pi^+ n$

$K_0^*(1430)$ REFERENCES

BUGG	10	PR D81 014002	D.V. Bugg	(LOQM)
LINK	09	PL B681 14	J.M. Link *et al.*	(FNAL FOCUS Collab.)
BONVICINI	08A	PR D78 052001	G. Bonvicini *et al.*	(CLEO Collab.)
LINK	07	PL B648 156	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	07B	PL B653 1	J.M. Link *et al.*	(FNAL FOCUS Collab.)
ABLIKIM	06C	PL B633 681	M. Ablikim *et al.*	(BES Collab.)
AITALA	06	PR D73 032004	E.M. Aitala *et al.*	(FNAL E791 Collab.)
Also		PR D74 059901 (errat.)	E.M. Aitala *et al.*	(FNAL E791 Collab.)
BUGG	06	PL B632 471	D.V. Bugg	(LOQM)
ZHOU	06	NP A775 212	Z.Y. Zhou, H.Q. Zheng	
ABLIKIM	05Q	PR D72 092002	M. Ablikim *et al.*	(BES Collab.)
ZHENG	04	NP A733 235	H.Q. Zheng *et al.*	
BUGG	03	PL B572 1	D.V. Bugg	
LI	03	PR D67 034025	L. Li, B. Zou, G. Li	
AITALA	02	PRL 89 121801	E.M. Aitala *et al.*	(FNAL E791 Collab.)
JAMIN	00	NP B587 331	M. Jamin *et al.*	
BARBERIS	98E	PL B436 204	D. Barberis *et al.*	(Omega Expt.)
ANISOVICH	97C	PL B413 137	A.V. Anisovich, A.V. Sarantsev	
TORNQVIST	96	PRL 76 1575	N.A. Tornqvist, M. Roos	(HELS)
ASTON	88	NP B296 493	D. Aston *et al.*	(SLAC, NAGO, CINC, INUS)
BAUBILLIER	84B	ZPHY C26 37	M. Baubillier *et al.*	(BIRM, CERN, GLAS+)
ESTABROOKS	78	NP B133 490	P.G. Estabrooks *et al.*	(MCGI, CARL, DURH+)
MARTIN	78	NP B134 392	A.D. Martin *et al.*	(DURH, GEVA)