$\omega(782)$

$I^G(J^{PC}) = 0^-(1^{--})$

ω(782) MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
782.65±0.12 OUR AVERAGE		Error includes scale factor of 1.9. See the ideogram below.			
783.20±0.13±0.16	18680	AKHMETSHIN	05	CMD2	0.60–1.38 $e^+e^- \to \pi^0\gamma$
782.68±0.09±0.04	11200	[1] AKHMETSHIN	04	CMD2	$e^+e^- \to \pi^+\pi^-\pi^0$
782.79±0.08±0.09	1.2M	[2] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
782.7 ±0.1 ±1.5	19500	WURZINGER	95	SPEC	1.33 $pd \to {}^3\mathrm{He}\omega$
781.96±0.17±0.80	11k	[3] AMSLER	94C	CBAR	0.0 $\overline{p}p \to \omega\eta\pi^0$
782.08±0.36±0.82	3463	[4] AMSLER	94C	CBAR	0.0 $\overline{p}p \to \omega\eta\pi^0$
781.96±0.13±0.17	15k	AMSLER	93B	CBAR	0.0 $\overline{p}p \to \omega\pi^0\pi^0$
782.4 ±0.2	270k	WEIDENAUER	93	ASTE	$\overline{p}p \to 2\pi^+2\pi^-\pi^0$
782.2 ±0.4	1488	KURDADZE	83B	OLYA	$e^+e^- \to \pi^+\pi^-\pi^0$
782.4 ±0.5	7000	[5] KEYNE	76	CNTR	$\pi^-p \to \omega n$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
781.91±0.24		[6] LEES	12G	BABR	$e^+e^- \to \pi^+\pi^-\gamma$
781.78±0.10		[7] BARKOV	87	CMD	$e^+e^- \to \pi^+\pi^-\pi^0$
783.3 ±0.4	433	CORDIER	80	DM1	$e^+e^- \to \pi^+\pi^-\pi^0$
782.5 ±0.8	33260	ROOS	80	RVUE	0.0–3.6 $\overline{p}p$
782.6 ±0.8	3000	BENKHEIRI	79	OMEG	9–12 $\pi^\pm p$
781.8 ±0.6	1430	COOPER	78B	HBC	0.7–0.8 $\overline{p}p \to 5\pi$
782.7 ±0.9	535	VANAPEL...	78	HBC	7.2 $\overline{p}p \to \overline{p}p\omega$
783.5 ±0.8	2100	GESSAROLI	77	HBC	11 $\pi^-p \to \omega n$
782.5 ±0.8	418	AGUILAR-...	72B	HBC	3.9,4.6 K^-p
783.4 ±1.0	248	BIZZARRI	71	HBC	0.0 $p\overline{p} \to K^+K^-\omega$
781.0 ±0.6	510	BIZZARRI	71	HBC	0.0 $p\overline{p} \to K_1K_1\omega$
783.7 ±1.0	3583	[8] COYNE	71	HBC	3.7 $\pi^+p \to p\pi^+\pi^+\pi^-\pi^0$
784.1 ±1.2	750	ABRAMOVI...	70	HBC	3.9 π^-p
783.2 ±1.6		[9] BIGGS	70B	CNTR	<4.1 $\gamma\mathrm{C} \to \pi^+\pi^-\mathrm{C}$
782.4 ±0.5	2400	BIZZARRI	69	HBC	0.0 $\overline{p}p$

[1] Update of AKHMETSHIN 00C.

[2] From the combined fit of ANTONELLI 92, ACHASOV 01E, ACHASOV 02E, and ACHASOV 03D data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E and ACHASOV 02E.

[3] From the $\eta \to \gamma\gamma$ decay.

[4] From the $\eta \to 3\pi^0$ decay.

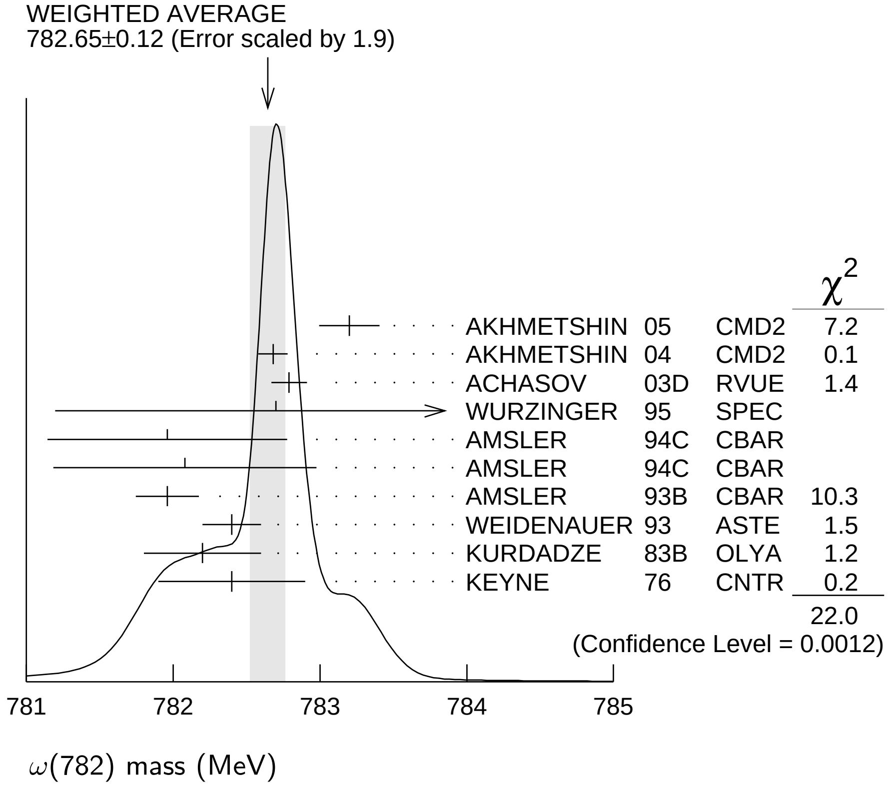
[5] Observed by threshold-crossing technique. Mass resolution = 4.8 MeV FWHM.

[6] From the $\rho-\omega$ interference in the $\pi^+\pi^-$ mass spectrum using the Breit-Wigner for the ω and leaving its mass and width as free parameters of the fit.

[7] Systematic uncertainties underestimated.

[8] From best-resolution sample of COYNE 71.

[9] From ω-ρ interference in the $\pi^+\pi^-$ mass spectrum assuming ω width 12.6 MeV.



$\omega(782)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
8.49±0.08 OUR AVERAGE					
8.68±0.23±0.10	11200	[1] AKHMETSHIN	04	CMD2	$e^+ e^- \to \pi^+ \pi^- \pi^0$
8.68±0.04±0.15	1.2M	[2] ACHASOV	03D	RVUE	0.44–2.00 $e^+ e^- \to \pi^+ \pi^- \pi^0$
8.2 ±0.3	19500	WURZINGER	95	SPEC	1.33 $p d \to {}^3\mathrm{He}\,\omega$
8.4 ±0.1		[3] AULCHENKO	87	ND	$e^+ e^- \to \pi^+ \pi^- \pi^0$
8.30±0.40		BARKOV	87	CMD	$e^+ e^- \to \pi^+ \pi^- \pi^0$
9.8 ±0.9	1488	KURDADZE	83B	OLYA	$e^+ e^- \to \pi^+ \pi^- \pi^0$
9.0 ±0.8	433	CORDIER	80	DM1	$e^+ e^- \to \pi^+ \pi^- \pi^0$
9.1 ±0.8	451	BENAKSAS	72B	OSPK	$e^+ e^- \to \pi^+ \pi^- \pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
8.13±0.45		[4] LEES	12G	BABR	$e^+ e^- \to \pi^+ \pi^- \gamma$
12 ±2	1430	COOPER	78B	HBC	0.7–0.8 $\overline{p} p \to 5\pi$
9.4 ±2.5	2100	GESSAROLI	77	HBC	11 $\pi^- p \to \omega n$
10.22±0.43	20000	[5] KEYNE	76	CNTR	$\pi^- p \to \omega n$
13.3 ±2	418	AGUILAR-...	72B	HBC	3.9,4.6 $K^- p$
10.5 ±1.5		BORENSTEIN	72	HBC	2.18 $K^- p$
7.70±0.9 ±1.15	940	BROWN	72	MMS	2.5 $\pi^- p \to n\mathrm{MM}$
10.3 ±1.4	510	BIZZARRI	71	HBC	0.0 $p \overline{p} \to K_1 K_1 \omega$
12.8 ±3.0	248	BIZZARRI	71	HBC	0.0 $p \overline{p} \to K^+ K^- \omega$
9.5 ±1.0	3583	COYNE	71	HBC	3.7 $\pi^+ p \to p \pi^+ \pi^+ \pi^- \pi^0$

[1] Update of AKHMETSHIN 00C.
[2] From the combined fit of ANTONELLI 92, ACHASOV 01E, ACHASOV 02E, and ACHASOV 03D data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E and ACHASOV 02E.
[3] Relativistic Breit-Wigner includes radiative corrections.
[4] From the $\rho-\omega$ interference in the $\pi^+\pi^-$ mass spectrum using the Breit-Wigner for the ω and leaving its mass and width as free parameters of the fit.
[5] Observed by threshold-crossing technique. Mass resolution = 4.8 MeV FWHM.

ω(782) DECAY MODES

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	$\pi^+\pi^-\pi^0$		(89.2 ± 0.7) %	
Γ_2	$\pi^0\gamma$		(8.28 ± 0.28) %	S=2.1
Γ_3	$\pi^+\pi^-$		$(1.53^{+0.11}_{-0.13})$ %	S=1.2
Γ_4	neutrals (excluding $\pi^0\gamma$)		$(8 \; ^{+8}_{-5}) \times 10^{-3}$	S=1.1
Γ_5	$\eta\gamma$		$(4.6 \pm 0.4) \times 10^{-4}$	S=1.1
Γ_6	$\pi^0 e^+ e^-$		$(7.7 \pm 0.6) \times 10^{-4}$	
Γ_7	$\pi^0\mu^+\mu^-$		$(1.3 \pm 0.4) \times 10^{-4}$	S=2.1
Γ_8	$\eta e^+ e^-$			
Γ_9	$e^+ e^-$		$(7.28 \pm 0.14) \times 10^{-5}$	S=1.3
Γ_{10}	$\pi^+\pi^-\pi^0\pi^0$		$< 2 \times 10^{-4}$	CL=90%
Γ_{11}	$\pi^+\pi^-\gamma$		$< 3.6 \times 10^{-3}$	CL=95%
Γ_{12}	$\pi^+\pi^-\pi^+\pi^-$		$< 1 \times 10^{-3}$	CL=90%
Γ_{13}	$\pi^0\pi^0\gamma$		$(6.6 \pm 1.1) \times 10^{-5}$	
Γ_{14}	$\eta\pi^0\gamma$		$< 3.3 \times 10^{-5}$	CL=90%
Γ_{15}	$\mu^+\mu^-$		$(9.0 \pm 3.1) \times 10^{-5}$	
Γ_{16}	3γ		$< 1.9 \times 10^{-4}$	CL=95%
	Charge conjugation (C) violating modes			
Γ_{17}	$\eta\pi^0$	C	$< 2.1 \times 10^{-4}$	CL=90%
Γ_{18}	$2\pi^0$	C	$< 2.1 \times 10^{-4}$	CL=90%
Γ_{19}	$3\pi^0$	C	$< 2.3 \times 10^{-4}$	CL=90%

CONSTRAINED FIT INFORMATION

An overall fit to 15 branching ratios uses 51 measurements and one constraint to determine 10 parameters. The overall fit has a χ^2 = 51.8 for 42 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle\delta x_i \delta x_j\right\rangle/(\delta x_i \cdot \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_2	22								
x_3	−18	−4							
x_4	−92	−56	1						
x_5	7	7	−1	−9					
x_6	−1	0	0	0	0				
x_7	−1	0	0	0	0	0			
x_9	−38	−33	7	44	−21	0	0		
x_{13}	1	4	0	−2	0	0	0	−1	
x_{15}	0	0	0	0	0	0	0	0	0
	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_9	x_{13}

ω(782) PARTIAL WIDTHS

$\Gamma(\pi^0\gamma)$ Γ_2

VALUE (keV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •					
880±50	7815	[1] ACHASOV	13	SND	1.05–2.00 $e^+e^- \to \pi^0\pi^0\gamma$
788±12±27	36500	[2] ACHASOV	03	SND	0.60–0.97 $e^+e^- \to \pi^0\gamma$
764±51	10625	DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$

[1] Systematic uncertainty not estimated.
[2] Using Γ_ω = 8.44 ± 0.09 MeV and B($\omega \to \pi^0\gamma$) from ACHASOV 03.

$\Gamma(\eta\gamma)$ Γ_5

VALUE (keV)	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
6.1±2.5	[1] DOLINSKY	89	ND	$e^+e^- \to \eta\gamma$

[1] Using Γ_ω = 8.4 ± 0.1 MeV and B($\omega \to \eta\gamma$) from DOLINSKY 89.

$\Gamma(e^+e^-)$ Γ_9

VALUE (keV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.60 ±0.02 OUR EVALUATION					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.591±0.015	11200	[1,2] AKHMETSHIN	04	CMD2	$e^+e^- \to \pi^+\pi^-\pi^0$
0.653±0.003±0.021	1.2M	[3] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
0.600±0.031	10625	DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$

[1] Using B($\omega \to \pi^+\pi^-\pi^0$) = 0.891 ± 0.007 and Γ_{total} = 8.44 ± 0.09 MeV.
[2] Update of AKHMETSHIN 00C.
[3] Using ACHASOV 03, ACHASOV 03D and B($\omega \to \pi^+\pi^-$) = (1.70 ± 0.28)%.

$\omega(782)$ $\Gamma(e^+e^-)\Gamma(i)/\Gamma^2(\text{total})$

$\Gamma(e^+e^-)/\Gamma_{total} \times \Gamma(\pi^+\pi^-\pi^0)/\Gamma_{total}$ — $\Gamma_9/\Gamma \times \Gamma_1/\Gamma$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
6.49±0.11 OUR FIT Error includes scale factor of 1.3.					
6.38±0.10 OUR AVERAGE Error includes scale factor of 1.1.					
6.24±0.11±0.08	11.2k	[1] AKHMETSHIN	04	CMD2	$e^+e^- \to \pi^+\pi^-\pi^0$
6.70±0.06±0.27		AUBERT,B	04N	BABR	10.6 $e^+e^- \to \pi^+\pi^-\pi^0\gamma$
6.74±0.04±0.24	1.2M	[2,3] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
6.37±0.35		[2] DOLINSKY	89	ND	$e^+e^- \to \pi^+\pi^-\pi^0$
6.45±0.24		[2] BARKOV	87	CMD	$e^+e^- \to \pi^+\pi^-\pi^0$
5.79±0.42	1488	[2] KURDADZE	83B	OLYA	$e^+e^- \to \pi^+\pi^-\pi^0$
5.89±0.54	433	[2] CORDIER	80	DM1	$e^+e^- \to \pi^+\pi^-\pi^0$
7.54±0.84	451	[2] BENAKSAS	72B	OSPK	$e^+e^- \to \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
6.20±0.13		[4] BENAYOUN	10	RVUE	0.4–1.05 e^+e^-

[1] Update of AKHMETSHIN 00C.
[2] Recalculated by us from the cross section in the peak.
[3] From the combined fit of ANTONELLI 92, ACHASOV 01E, ACHASOV 02E, and ACHASOV 03D data on the $\pi^+\pi^-\pi^0$ and ANTONELLI 92 on the $\omega\pi^+\pi^-$ final states. Supersedes ACHASOV 99E and ACHASOV 02E.
[4] A simultaneous fit of $e^+e^- \to \pi^+\pi^-$, $\pi^+\pi^-\pi^0$, $\pi^0\gamma$, $\eta\gamma$ data.

$\Gamma(e^+e^-)/\Gamma_{total} \times \Gamma(\pi^0\gamma)/\Gamma_{total}$ — $\Gamma_9/\Gamma \times \Gamma_2/\Gamma$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
6.02±0.20 OUR FIT Error includes scale factor of 1.9.					
6.45±0.17 OUR AVERAGE					
6.47±0.14±0.39	18680	AKHMETSHIN	05	CMD2	0.60-1.38 $e^+e^- \to \pi^0\gamma$
6.50±0.11±0.20	36500	[1] ACHASOV	03	SND	0.60–0.97 $e^+e^- \to \pi^0\gamma$
6.34±0.21±0.21	10625	[2] DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
6.80±0.13		[3] BENAYOUN	10	RVUE	0.4–1.05 e^+e^-

[1] Using $\sigma_{\phi \to \pi^0\gamma}$ from ACHASOV 00 and m_ω= 782.57 MeV in the model with the energy-independent phase of ρ-ω interference equal to $(-10.2 \pm 7.0)^\circ$.
[2] Recalculated by us from the cross section in the peak.
[3] A simultaneous fit of $e^+e^- \to \pi^+\pi^-$, $\pi^+\pi^-\pi^0$, $\pi^0\gamma$, $\eta\gamma$ data.

$\Gamma(e^+e^-)/\Gamma_{total} \times \Gamma(\pi^+\pi^-)/\Gamma_{total}$ — $\Gamma_9/\Gamma \times \Gamma_3/\Gamma$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
1.225±0.058±0.041	800k	[1] ACHASOV	06	SND	$e^+e^- \to \pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.166±0.036		[2] BENAYOUN	13	RVUE	0.4–1.05 e^+e^-
1.05 ±0.08		[3] DAVIER	13	RVUE	$e^+e^- \to \pi^+\pi^-(\gamma)$

[1] Supersedes ACHASOV 05A.
[2] A simultaneous fit to $e^+e^- \to \pi^+\pi^-$, $\pi^+\pi^-\pi^0$, $\pi^0\gamma$, $\eta\gamma$, $K\overline{K}$, and $\tau^- \to \pi^-\pi^0\nu_\tau$ data. Supersedes BENAYOUN 10.
[3] From $e^+e^- \to \pi^+\pi^-(\gamma)$ data of LEES 12G.

$\Gamma(e^+e^-)/\Gamma_{total} \times \Gamma(\eta\gamma)/\Gamma_{total}$ — $\Gamma_9/\Gamma \times \Gamma_5/\Gamma$

VALUE (units 10^{-8})	EVTS	DOCUMENT ID		TECN	COMMENT
3.32±0.28 OUR FIT	Error includes scale factor of 1.1.				
3.18±0.28 OUR AVERAGE					
3.10±0.31±0.11	33k	[1] ACHASOV	07B	SND	0.6–1.38 $e^+e^- \to \eta\gamma$
$3.17^{+1.85}_{-1.31}\pm0.21$	17.4k	[2] AKHMETSHIN	05	CMD2	0.60-1.38 $e^+e^- \to \eta\gamma$
3.41±0.52±0.21	23k	[3,4] AKHMETSHIN	01B	CMD2	$e^+e^- \to \eta\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
4.50±0.10		[5] BENAYOUN	10	RVUE	0.4–1.05 e^+e^-

[1] From a combined fit of $\sigma(e^+e^- \to \eta\gamma)$ with $\eta \to 3\pi^0$ and $\eta \to \pi^+\pi^-\pi^0$, and fixing B($\eta \to 3\pi^0$) / B($\eta \to \pi^+\pi^-\pi^0$) = 1.44 ± 0.04. Recalculated by us from the cross section at the peak. Supersedes ACHASOV 00D and ACHASOV 06A.
[2] From the $\eta \to 2\gamma$ decay and using B($\eta \to \gamma\gamma$)= 39.43 ± 0.26%.
[3] From the $\eta \to 3\pi^0$ decay and using B($\eta \to 3\pi^0$)= (32.24 ± 0.29) × 10^{-2}.
[4] The combined fit from 600 to 1380 MeV taking into account ρ(770), ω(782), ϕ(1020), and ρ(1450) (mass and width fixed at 1450 MeV and 310 MeV respectively).
[5] A simultaneous fit of $e^+e^- \to \pi^+\pi^-$, $\pi^+\pi^-\pi^0$, $\pi^0\gamma$, $\eta\gamma$ data.

ω(782) BRANCHING RATIOS

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_1/Γ

NIECKNIG 12 describes final-state interactions between the three pions in a dispersive framework using data on the $\pi\pi$ P-wave scattering phase shift.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.9024±0.0019		[1] AMBROSINO	08G	KLOE	1.0–1.03 $e^+e^- \to \pi^+\pi^-2\pi^0$, $2\pi^0\gamma$
0.8965±0.0016±0.0048	1.2M	[2,3] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
0.880 ±0.020 ±0.032	11200	[3,4] AKHMETSHIN	00C	CMD2	$e^+e^- \to \pi^+\pi^-\pi^0$
0.8942±0.0062		[3] DOLINSKY	89	ND	$e^+e^- \to \pi^+\pi^-\pi^0$

[1] Not independent of $\Gamma(\pi^0\gamma)$ / $\Gamma(\pi^+\pi^-\pi^0)$ from AMBROSINO 08G.
[2] Using ACHASOV 03, ACHASOV 03D and B($\omega \to \pi^+\pi^-$) = (1.70 ± 0.28)%.
[3] Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\pi^+\pi^-\pi^0)/\Gamma^2_{total}$.
[4] Using $\Gamma(e^+e^-)$=0.60 ± 0.02 keV.

$\Gamma(\pi^0\gamma)/\Gamma_{total}$ — Γ_2/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
8.09 ± 0.14		[1] AMBROSINO	08G	KLOE	$e^+e^- \to \pi^+\pi^-2\pi^0$, $2\pi^0\gamma$
$9.06\pm0.20\pm0.57$	18680	[2,3] AKHMETSHIN	05	CMD2	0.60-1.38 $e^+e^- \to \pi^0\gamma$
$9.34\pm0.15\pm0.31$	36500	[3] ACHASOV	03	SND	0.60–0.97 $e^+e^- \to \pi^0\gamma$
$8.65\pm0.16\pm0.42$	1.2M	[4,5] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
8.39 ± 0.24	9975	[6] BENAYOUN	96	RVUE	$e^+e^- \to \pi^0\gamma$
8.88 ± 0.62	10625	[3] DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$

[1] Not independent of $\Gamma(\pi^0\gamma)$ / $\Gamma(\pi^+\pi^-\pi^0)$ from AMBROSINO 08G.
[2] Using B($\omega \to e^+e^-$)= $(7.14 \pm 0.13) \times 10^{-5}$.
[3] Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\pi^0\gamma)/\Gamma^2_{total}$.
[4] Using ACHASOV 03, ACHASOV 03D and B($\omega \to \pi^+\pi^-$) = (1.70 ± 0.28)%.
[5] Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\pi^+\pi^-\pi^0)/\Gamma^2_{total}$.
[6] Reanalysis of DRUZHININ 84, DOLINSKY 89, DOLINSKY 91 taking into account the triangle anomaly contributions.

$\Gamma(\pi^0\gamma)/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_2/Γ_1

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
9.28±0.31 OUR FIT Error includes scale factor of 2.3.				
9.05±0.27 OUR AVERAGE Error includes scale factor of 1.8.				
8.97 ± 0.16	AMBROSINO	08G	KLOE	$e^+e^- \to \pi^+\pi^-2\pi^0$, $2\pi^0\gamma$
$9.94\pm0.36\pm0.38$	[1] AULCHENKO	00A	SND	$e^+e^- \to \pi^+\pi^-2\pi^0$, $2\pi^0\gamma$
$8.4\ \pm1.3$	KEYNE	76	CNTR	$\pi^-p \to \omega n$
$10.9\ \pm2.5$	BENAKSAS	72C	OSPK	$e^+e^- \to \pi^0\gamma$
$8.1\ \pm2.0$	BALDIN	71	HLBC	2.9 π^+p
$13\ \ \pm4$	JACQUET	69B	HLBC	2.05 $\pi^+p \to \pi^+p\omega$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$9.7\ \pm0.2\ \pm0.5$	[2,3] ACHASOV	03D	RVUE	0.44–2.00 $e^+e^- \to \pi^+\pi^-\pi^0$
$9.9\ \pm0.7$	[2] DOLINSKY	89	ND	$e^+e^- \to \pi^0\gamma$

[1] From $\sigma_0^{\omega\pi^0 \to \pi^0\pi^0\gamma}(m_\phi)/\sigma_0^{\omega\pi^0 \to \pi^+\pi^-\pi^0\pi^0}(m_\phi)$ with a phase-space correction factor of 1/1.023.
[2] Not independent of the corresponding $\Gamma(e^+e^-) \times \Gamma(\pi^0\gamma)/\Gamma^2_{total}$.
[3] Using ACHASOV 03. Based on 1.2M events.

$\Gamma(\pi^+\pi^-)/\Gamma_{total}$ — Γ_3/Γ

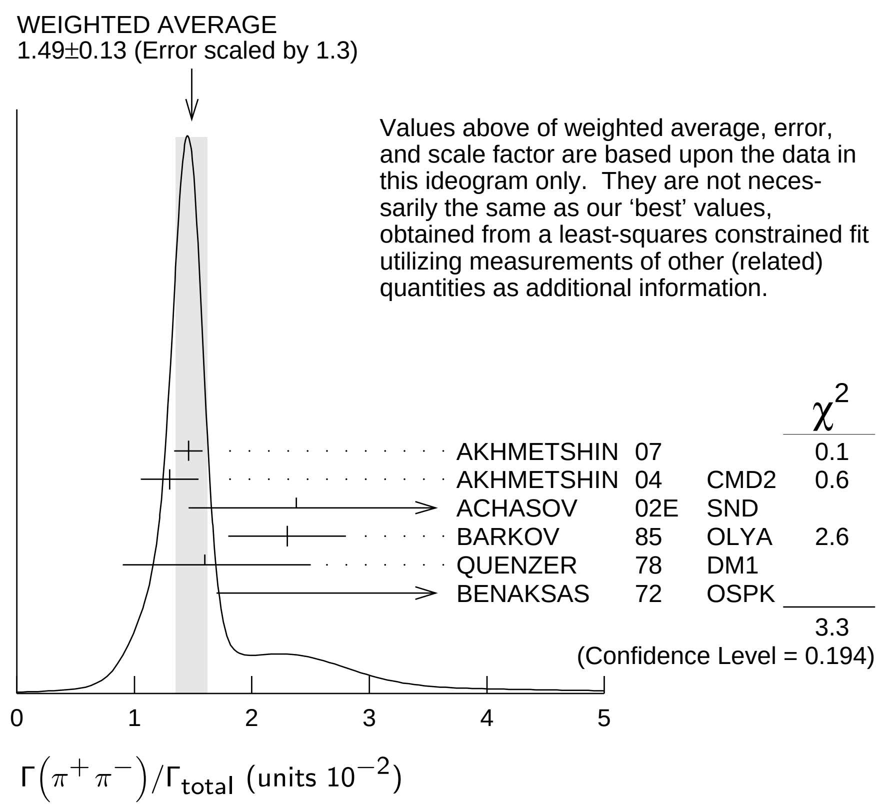
See also $\Gamma(\pi^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
$1.53^{+0.11}_{-0.13}$ OUR FIT Error includes scale factor of 1.2.					
1.49±0.13 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.					
$1.46\pm0.12\pm0.02$	900k	[1] AKHMETSHIN	07		$e^+e^- \to \pi^+\pi^-$
$1.30\pm0.24\pm0.05$	11.2k	[2] AKHMETSHIN	04	CMD2	$e^+e^- \to \pi^+\pi^-$
$2.38^{+1.77}_{-0.90}\pm0.18$	5.4k	[3] ACHASOV	02E	SND	1.1–1.38 $e^+e^- \to \pi^+\pi^-\pi^0$
$2.3\ \pm0.5$		BARKOV	85	OLYA	$e^+e^- \to \pi^+\pi^-$
$1.6\ ^{+0.9}_{-0.7}$		QUENZER	78	DM1	$e^+e^- \to \pi^+\pi^-$
$3.6\ \pm1.9$		BENAKSAS	72	OSPK	$e^+e^- \to \pi^+\pi^-$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1.75 ± 0.11	4.5M	[4] ACHASOV	05A	SND	$e^+ e^- \to \pi^+ \pi^-$
2.01 ± 0.29		[5] BENAYOUN	03	RVUE	$e^+ e^- \to \pi^+ \pi^-$
1.9 ± 0.3		[6] GARDNER	99	RVUE	$e^+ e^- \to \pi^+ \pi^-$
2.3 ± 0.4		[7] BENAYOUN	98	RVUE	$e^+ e^- \to \pi^+ \pi^-$, $\mu^+ \mu^-$
1.0 ± 0.11		[8] WICKLUND	78	ASPK	3,4,6 $\pi^{\pm} N$
1.22 ± 0.30		ALVENSLEB...	71C	CNTR	Photoproduction
$1.3 {+1.2 \atop -0.9}$		MOFFEIT	71	HBC	2.8,4.7 γp
$0.80 {+0.28 \atop -0.20}$		[9] BIGGS	70B	CNTR	$4.2 \gamma C \to \pi^+ \pi^- C$

[1] A combined fit of AKHMETSHIN 07, AULCHENKO 06, and AULCHENKO 05.
[2] Update of AKHMETSHIN 02.
[3] From the $m_{\pi^+\pi^-}$ spectrum taking into account the interference of the $\rho\pi$ and $\omega\pi$ amplitudes.
[4] Using $\Gamma(\omega \to e^+ e^-)$ from the 2004 Edition of this Review (PDG 04).
[5] Using the data of AKHMETSHIN 02 in the hidden local symmetry model.
[6] Using the data of BARKOV 85.
[7] Using the data of BARKOV 85 in the hidden local symmetry model.
[8] From a model-dependent analysis assuming complete coherence.
[9] Re-evaluated under $\Gamma(\pi^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$ by BEHREND 71 using more accurate $\omega \to \rho$ photoproduction cross-section ratio.



$\Gamma(\pi^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_3/Γ_1

See also $\Gamma(\pi^+\pi^-)/\Gamma_{total}$.

VALUE	DOCUMENT ID		TECN	COMMENT
0.0172±0.0014 OUR FIT Error includes scale factor of 1.2.				
0.026 ±0.005 OUR AVERAGE				
$0.021\ ^{+0.028}_{-0.009}$	[1,2] RATCLIFF	72	ASPK	$15\ \pi^- p \to n 2\pi$
0.028 ± 0.006	[1] BEHREND	71	ASPK	Photoproduction
$0.022\ ^{+0.009}_{-0.01}$	[3] ROOS	70	RVUE	

[1] The fitted width of these data is 160 MeV in agreement with present average, thus the ω contribution is overestimated. Assuming ρ width 145 MeV.
[2] Significant interference effect observed. NB of $\omega \to 3\pi$ comes from an extrapolation.
[3] ROOS 70 combines ABRAMOVICH 70 and BIZZARRI 70.

$\Gamma(\pi^+\pi^-)/\Gamma(\pi^0\gamma)$ — Γ_3/Γ_2

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.20±0.04	1.98M	[1] ALOISIO	03	KLOE	$1.02\ e^+e^- \to \pi^+\pi^-\pi^0$

[1] Using the data of ALOISIO 02D.

$\Gamma(\text{neutrals})/\Gamma_{total}$ — $(\Gamma_2+\Gamma_4)/\Gamma$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.091±0.006 OUR FIT					
0.081±0.011 OUR AVERAGE					
0.075 ± 0.025		BIZZARRI	71	HBC	$0.0\ p\overline{p}$
0.079 ± 0.019		DEINET	69B	OSPK	$1.5\ \pi^- p$
0.084 ± 0.015		BOLLINI	68C	CNTR	$2.1\ \pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.073 ± 0.018	42	BASILE	72B	CNTR	$1.67\ \pi^- p$

$\Gamma(\text{neutrals})/\Gamma(\pi^+\pi^-\pi^0)$ — $(\Gamma_2+\Gamma_4)/\Gamma_1$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.102±0.008 OUR FIT					
$\mathbf{0.103^{+0.011}_{-0.010}}$ **OUR AVERAGE**					
0.15 ± 0.04	46	AGUILAR-...	72B	HBC	$3.9,4.6\ K^- p$
0.10 ± 0.03	19	BARASH	67B	HBC	$0.0\ \overline{p}p$
0.134 ± 0.026	850	DIGIUGNO	66B	CNTR	$1.4\ \pi^- p$
0.097 ± 0.016	348	FLATTE	66	HBC	$1.4 - 1.7\ K^- p \to \Lambda MM$
$0.06\ ^{+0.05}_{-0.02}$		JAMES	66	HBC	$2.1\ \pi^+ p$
0.08 ± 0.03	35	KRAEMER	64	DBC	$1.2\ \pi^+ d$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.11 ± 0.02	20	BUSCHBECK	63	HBC	$1.5\ K^- p$

$\Gamma(\pi^0\gamma)/\Gamma(\text{neutrals})$ — $\Gamma_2/(\Gamma_2+\Gamma_4)$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.78 ± 0.07		[1] DAKIN	72	OSPK	1.4 $\pi^- p \to n$MM
>0.81	90	DEINET	69B	OSPK	

[1] Error statistical only. Authors obtain good fit also assuming $\pi^0\gamma$ as the only neutral decay.

$\Gamma(\text{neutrals})/\Gamma(\text{charged particles})$ — $(\Gamma_2+\Gamma_4)/(\Gamma_1+\Gamma_3)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.100±0.008 OUR FIT				
0.124±0.021	FELDMAN	67C	OSPK	1.2 $\pi^- p$

$\Gamma(\eta\gamma)/\Gamma_{\text{total}}$ — Γ_5/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
4.6 ±0.4 OUR FIT Error includes scale factor of 1.1.					
6.3 ±1.3 OUR AVERAGE Error includes scale factor of 1.2.					
6.6 ± 1.7		[1] ABELE	97E	CBAR	0.0 $\overline{p}p \to 5\gamma$
8.3 ± 2.1		ALDE	93	GAM2	$38\pi^- p \to \omega n$
$3.0\ ^{+2.5}_{-1.8}$		[2] ANDREWS	77	CNTR	6.7–10 γCu
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$4.3\pm0.5\pm0.1$	33k	[3] ACHASOV	07B	SND	0.6–1.38 $e^+e^-\to\eta\gamma$
$4.44^{+2.59}_{-1.83}\pm0.28$	17.4k	[4,5] AKHMETSHIN	05	CMD2	0.60-1.38 $e^+e^-\to\eta\gamma$
$5.10\pm0.72\pm0.34$	23k	[6] AKHMETSHIN	01B	CMD2	$e^+e^-\to\eta\gamma$
0.7 to 5.5		[7] CASE	00	CBAR	0.0 $p\overline{p}\to\eta\eta\gamma$
$6.56^{+2.41}_{-2.55}$	3525	[2,8] BENAYOUN	96	RVUE	$e^+e^-\to\eta\gamma$
7.3 ± 2.9		[2,4] DOLINSKY	89	ND	$e^+e^-\to\eta\gamma$

[1] No flat $\eta\eta\gamma$ background assumed.

[2] Solution corresponding to constructive ω-ρ interference.

[3] ACHASOV 07B reports $[\Gamma(\omega(782)\to\eta\gamma)/\Gamma_{\text{total}}]\times[B(\omega(782)\to e^+e^-)] = (3.10\pm0.31\pm0.11)\times10^{-8}$ which we divide by our best value $B(\omega(782)\to e^+e^-) = (7.28\pm0.14)\times10^{-5}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Supersedes ACHASOV 00D and ACHASOV 06A.

[4] Not independent of the corresponding $\Gamma(e^+e^-)\times\Gamma(\eta\gamma)/\Gamma^2_{\text{total}}$.

[5] Using $B(\omega\to e^+e^-) = (7.14\pm0.13)\times10^{-5}$ and $B(\eta\to\gamma\gamma) = 39.43\pm0.26\%$.

[6] Using $B(\omega\to e^+e^-) = (7.07\pm0.19)\times10^{-5}$ and using $B(\eta\to3\pi^0) = (32.24\pm0.29)\times10^{-2}$. Solution corresponding to constructive ω-ρ interference. The combined fit from 600 to 1380 MeV taking into account $\rho(770)$, $\omega(782)$, $\phi(1020)$, and $\rho(1450)$ (mass and width fixed at 1450 MeV and 310 MeV respectively). Not independent of the corresponding $\Gamma(e^+e^-)\times\Gamma(\eta\gamma)/\Gamma^2_{\text{total}}$.

[7] Depending on the degree of coherence with the flat $\eta\eta\gamma$ background and using $B(\omega\to\pi^0\gamma) = (8.5\pm0.5)\times10^{-2}$.

[8] Reanalysis of DRUZHININ 84, DOLINSKY 89, DOLINSKY 91 taking into account the triangle anomaly contributions.

$\Gamma(\eta\gamma)/\Gamma(\pi^0\gamma)$ — Γ_5/Γ_2

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0098 ± 0.0024	[1] ALDE	93	GAM2	$38\pi^- p \to \omega n$
0.0082 ± 0.0033	[2] DOLINSKY	89	ND	$e^+ e^- \to \eta\gamma$
0.010 ± 0.045	APEL	72B	OSPK	4–8 $\pi^- p \to n 3\gamma$

[1] Model independent determination.
[2] Solution corresponding to constructive ω-ρ interference.

$\Gamma(\pi^0 e^+ e^-)/\Gamma_{total}$ — Γ_6/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.7 ±0.6 OUR FIT					
7.7 ±0.6 OUR AVERAGE					
$7.61 \pm 0.53 \pm 0.64$		ACHASOV	08	SND	0.36–0.97 $e^+ e^- \to \pi^0 e^+ e^-$
$8.19 \pm 0.71 \pm 0.62$		AKHMETSHIN	05A	CMD2	0.72-0.84 $e^+ e^-$
5.9 ± 1.9	43	DOLINSKY	88	ND	$e^+ e^- \to \pi^0 e^+ e^-$

$\Gamma(\pi^0 \mu^+ \mu^-)/\Gamma_{total}$ — Γ_7/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.3 ±0.4 OUR FIT Error includes scale factor of 2.1.					
1.3 ±0.4 OUR AVERAGE Error includes scale factor of 2.1.					
$1.72 \pm 0.25 \pm 0.14$	3k	ARNALDI	09	NA60	158A In−In collisions
0.96 ± 0.23		DZHELYADIN	81B	CNTR	25–33 $\pi^- p \to \omega n$

$\Gamma(\eta e^+ e^-)/\Gamma_{total}$ — Γ_8/Γ

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<1.1	AKHMETSHIN	05A	CMD2	0.72-0.84 $e^+ e^-$

$\Gamma(e^+ e^-)/\Gamma_{total}$ — Γ_9/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.728±0.014 OUR FIT Error includes scale factor of 1.3.					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.700 ± 0.016	11200	[1,2] AKHMETSHIN	04	CMD2	$e^+ e^- \to \pi^+ \pi^- \pi^0$
$0.752 \pm 0.004 \pm 0.024$	1.2M	[2,3] ACHASOV	03D	RVUE	0.44–2.00 $e^+ e^- \to \pi^+ \pi^- \pi^0$
0.714 ± 0.036		[2] DOLINSKY	89	ND	$e^+ e^- \to \pi^+ \pi^- \pi^0$
0.72 ± 0.03		[2] BARKOV	87	CMD	$e^+ e^- \to \pi^+ \pi^- \pi^0$
0.64 ± 0.04	1488	[2] KURDADZE	83B	OLYA	$e^+ e^- \to \pi^+ \pi^- \pi^0$
0.675 ± 0.069	433	[2] CORDIER	80	DM1	$e^+ e^- \to \pi^+ \pi^- \pi^0$
0.83 ± 0.10	451	[2] BENAKSAS	72B	OSPK	$e^+ e^- \to \pi^+ \pi^- \pi^0$
0.77 ± 0.06		[4] AUGUSTIN	69D	OSPK	$e^+ e^- \to \pi^+ \pi^- \pi^0$
0.65 ± 0.13	33	[5] ASTVACAT...	68	OSPK	Assume SU(3)+mixing

[1] Using B($\omega \to \pi^+ \pi^- \pi^0$) = 0.891 ± 0.007. Update of AKHMETSHIN 00C.
[2] Not independent of the corresponding $\Gamma(e^+ e^-) \times \Gamma(\pi^+ \pi^- \pi^0)/\Gamma^2_{total}$.
[3] Using ACHASOV 03, ACHASOV 03D and B($\omega \to \pi^+ \pi^-$) = (1.70 ± 0.28)%.
[4] Rescaled by us to correspond to ω width 8.4 MeV. Systematic errors underestimated.
[5] Not resolved from ρ decay. Error statistical only.

$\Gamma(\pi^+\pi^-\pi^0\pi^0)/\Gamma_{total}$ — Γ_{10}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
< 2	90	ACHASOV	09A	SND	$e^+e^- \rightarrow \pi^+\pi^-\pi^0\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<200	90	KURDADZE	86	OLYA	$e^+e^- \rightarrow \pi^+\pi^-\pi^0\pi^0$

$\Gamma(\pi^+\pi^-\gamma)/\Gamma_{total}$ — Γ_{11}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0036	95	WEIDENAUER	90	ASTE	$p\overline{p} \rightarrow \pi^+\pi^-\pi^+\pi^-\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.004	95	BITYUKOV	88B	SPEC	$32\ \pi^- p \rightarrow \pi^+\pi^-\gamma X$

$\Gamma(\pi^+\pi^-\gamma)/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_{11}/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.066	90	KALBFLEISCH	75	HBC	$2.18\ K^- p \rightarrow \Lambda\pi^+\pi^-\gamma$
<0.05	90	FLATTE	66	HBC	$1.2 – 1.7\ K^- p \rightarrow \Lambda\pi^+\pi^-\gamma$

$\Gamma(\pi^+\pi^-\pi^+\pi^-)/\Gamma_{total}$ — Γ_{12}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1 \times 10^{-3}$	90	KURDADZE	88	OLYA	$e^+e^- \rightarrow \pi^+\pi^-\pi^+\pi^-$

$\Gamma(\pi^0\pi^0\gamma)/\Gamma_{total}$ — Γ_{13}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
6.6±1.1 OUR FIT					
6.5±1.2 OUR AVERAGE					
$6.4^{+2.4}_{-2.0}\pm0.8$	190	[1] AKHMETSHIN	04B	CMD2	$0.6–0.97\ e^+e^- \rightarrow \pi^0\pi^0\gamma$
$6.6^{+1.4}_{-1.3}\pm0.6$	295	ACHASOV	02F	SND	$0.36–0.97\ e^+e^- \rightarrow \pi^0\pi^0\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$11.8^{+2.1}_{-1.9}\pm1.4$	190	[2] AKHMETSHIN	04B	CMD2	$0.6–0.97\ e^+e^- \rightarrow \pi^0\pi^0\gamma$
$7.8\pm2.7\pm2.0$	63	[1,3] ACHASOV	00G	SND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
$12.7\pm2.3\pm2.5$	63	[2,3] ACHASOV	00G	SND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$

[1] In the model assuming the $\rho \rightarrow \pi^0\pi^0\gamma$ decay via the $\omega\pi$ and $f_0(500)\gamma$ mechanisms.
[2] In the model assuming the $\rho \rightarrow \pi^0\pi^0\gamma$ decay via the $\omega\pi$ mechanism only.
[3] Superseded by ACHASOV 02F.

$\Gamma(\pi^0\pi^0\gamma)/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_{13}/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.00045	90	DOLINSKY	89	ND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.08	95	JACQUET	69B	HLBC	$2.05\ \pi^+ p \rightarrow \pi^+ p\omega$

$\Gamma(\pi^0\pi^0\gamma)/\Gamma(\pi^0\gamma)$ — Γ_{13}/Γ_2

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
8.0±1.3 OUR FIT						
8.5±2.9		40 ± 14	ALDE	94B	GAM2	$38\pi^- p \rightarrow \pi^0\pi^0\gamma n$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<$ 50	90		DOLINSKY	89	ND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
$<$1800	95		KEYNE	76	CNTR	$\pi^- p \rightarrow \omega n$
$<$1500	90		BENAKSAS	72C	OSPK	e^+e^-
$<$1400			BALDIN	71	HLBC	2.9 $\pi^+ p$
$<$1000	90		BARMIN	64	HLBC	1.3–2.8 $\pi^- p$

$\Gamma(\pi^0\pi^0\gamma)/\Gamma(\text{neutrals})$ — $\Gamma_{13}/(\Gamma_2+\Gamma_4)$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.22±0.07		[1] DAKIN	72	OSPK	1.4 $\pi^- p \rightarrow n$MM
$<$0.19	90	DEINET	69B	OSPK	

[1] See $\Gamma(\pi^0\gamma)/\Gamma(\text{neutrals})$.

$\Gamma(\eta\pi^0\gamma)/\Gamma_{\text{total}}$ — Γ_{14}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<3.3	90	AKHMETSHIN	04B	CMD2	0.6–0.97 $e^+e^- \rightarrow \eta\pi^0\gamma$

$\Gamma(\mu^+\mu^-)/\Gamma_{\text{total}}$ — Γ_{15}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
9.0±3.1 OUR FIT					
9.0±2.9±1.1	18	HEISTER	02C	ALEP	$Z \rightarrow \mu^+\mu^- + X$

$\Gamma(\mu^+\mu^-)/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_{15}/Γ_1

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.2	90	WILSON	69	OSPK	12 π^- C $\rightarrow$ Fe
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<$1.7	74	FLATTE	66	HBC	1.2 – 1.7 $K^- p \rightarrow \Lambda\mu^+\mu^-$
$<$1.2		BARBARO-...	65	HBC	2.7 $K^- p$

$\Gamma(\pi^0\mu^+\mu^-)/\Gamma(\mu^+\mu^-)$ — Γ_7/Γ_{15}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.2±0.6	30	[1] DZHELYADIN	79	CNTR	25–33 $\pi^- p$

[1] Superseded by DZHELYADIN 81B result above.

$\Gamma(3\gamma)/\Gamma_{\text{total}}$ — Γ_{16}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.9	95	[1] ABELE	97E	CBAR	0.0 $\overline{p}p \rightarrow 5\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<$2	90	[1] PROKOSHKIN	95	GAM2	38 $\pi^- p \rightarrow 3\gamma n$

[1] From direct 3γ decay search.

$\Gamma(\eta\pi^0)/\Gamma_{total}$ — Γ_{17}/Γ

Violates C conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.001	90	ALDE	94B	GAM2	$38\pi^- p \to \eta\pi^0 n$

$[\Gamma(\eta\gamma)+\Gamma(\eta\pi^0)]/\Gamma(\pi^+\pi^-\pi^0)$ — $(\Gamma_5+\Gamma_{17})/\Gamma_1$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.016	90	[1] FLATTE	66	HBC	$1.2-1.7\ K^- p \to \Lambda\pi^+\pi^-$ MM
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.045	95	JACQUET	69B	HLBC	$2.05\ \pi^+ p \to \pi^+ p\omega$

[1] Restated by us using B($\eta \to$ charged modes) = 29.2%.

$\Gamma(\eta\pi^0)/\Gamma(\pi^0\gamma)$ — Γ_{17}/Γ_2

Violates C conservation.

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<2.6	90	[1] STAROSTIN	09	CRYM	$\gamma p \to \eta\pi^0 p$

[1] STAROSTIN 09 reports $[\Gamma(\omega(782) \to \eta\pi^0)/\Gamma(\omega(782) \to \pi^0\gamma)] \times [B(\eta \to 2\gamma)] < 1.01 \times 10^{-3}$ which we divide by our best value $B(\eta \to 2\gamma) = 39.41 \times 10^{-2}$.

$\Gamma(2\pi^0)/\Gamma(\pi^0\gamma)$ — Γ_{18}/Γ_2

Violates C conservation and Bose-Einstein statistics.

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<2.59	90	STAROSTIN	09	CRYM	$\gamma p \to 2\pi^0 p$

$\Gamma(3\pi^0)/\Gamma_{total}$ — Γ_{19}/Γ

Violates C conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3 \times 10^{-4}$	90	PROKOSHKIN	95	GAM2	$38\ \pi^- p \to 3\pi^0 n$

$\Gamma(3\pi^0)/\Gamma(\pi^0\gamma)$ — Γ_{19}/Γ_2

Violates C conservation.

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<2.72	90	STAROSTIN	09	CRYM	$\gamma p \to 3\pi^0 p$

$\Gamma(3\pi^0)/\Gamma(\pi^+\pi^-\pi^0)$ — Γ_{19}/Γ_1

Violates C conservation.

VALUE	CL%	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.009	90	BARBERIS	01	$450\ pp \to p_f 3\pi^0 p_s$

PARAMETER Λ IN $\omega \to \pi^0\mu^+\mu^-$ DECAY

In the pole approximation the electromagnetic transition form factor for a resonance of mass M is given by the expression:

$$|F|^2 = (1 - M^2/\Lambda^2)^{-2},$$

where for the parameter Λ vector dominance predicts $\Lambda = M_\rho \approx 0.770$ GeV. The ARNALDI 09 measurement is in obvious conflict with this expectation. Note that for $\eta \rightarrow \mu^+ \mu^- \gamma$ decay ARNALDI 09 and DZHELYADIN 80 obtain the value of Λ consistent with vector dominance.

VALUE (GeV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.668±0.009±0.003	3k	ARNALDI	09	NA60	158A In−In collisions
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.65 ±0.03		DZHELYADIN	81B	CNTR	25–33 $\pi^- p \rightarrow \omega n$

ω(782) REFERENCES

ACHASOV	13	PR D88 054013	M.N. Achasov et al.	(SND Collab.)
BENAYOUN	13	EPJ C73 2453	M. Benayoun, P. David, L. DelBuono	(PARIN, BERLIN+)
DAVIER	13	EPJ C73 2597	M. Davier et al.	
LEES	12G	PR D86 032013	J.P. Lees et al.	(BABAR Collab.)
NIECKNIG	12	EPJ C72 2014	F. Niecknig, B. Kubis, S.P. Schneider	(BONN)
BENAYOUN	10	EPJ C65 211	M. Benayoun et al.	
ACHASOV	09A	JETP 109 379	M.N. Achasov et al.	(SND Collab.)
		Translated from ZETF 136 442.		
ARNALDI	09	PL B677 260	R. Arnaldi et al.	(NA60 Collab.)
STAROSTIN	09	PR C79 065201	A. Starostin et al.	(Crystal Ball Collab. at MAMI)
ACHASOV	08	JETP 107 61	M.N. Achasov et al.	(SND Collab.)
		Translated from ZETF 134 80.		
AMBROSINO	08G	PL B669 223	F. Ambrosino et al.	(KLOE Collab.)
ACHASOV	07B	PR D76 077101	M.N. Achasov et al.	(SND Collab.)
AKHMETSHIN	07	PL B648 28	R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
ACHASOV	06	JETP 103 380	M.N. Achasov et al.	(Novosibirsk SND Collab.)
		Translated from ZETF 130 437.		
ACHASOV	06A	PR D74 014016	M.N. Achasov et al.	(SND Collab.)
AULCHENKO	06	JETPL 84 413	V.M. Aulchenko et al.	(Novosibirsk CMD-2 Collab.)
		Translated from ZETFP 84 491.		
ACHASOV	05A	JETP 101 1053	M.N. Achasov et al.	(Novosibirsk SND Collab.)
		Translated from ZETF 128 1201.		
AKHMETSHIN	05	PL B605 26	R.R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
AKHMETSHIN	05A	PL B613 29	R.R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
AULCHENKO	05	JETPL 82 743	V.M. Aulchenko et al.	(Novosibirsk CMD-2 Collab.)
		Translated from ZETFP 82 841.		
AKHMETSHIN	04	PL B578 285	R.R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
AKHMETSHIN	04B	PL B580 119	R.R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
AUBERT,B	04N	PR D70 072004	B. Aubert et al.	(BABAR Collab.)
PDG	04	PL B592 1	S. Eidelman et al.	(PDG Collab.)
ACHASOV	03	PL B559 171	M.N. Achasov et al.	(Novosibirsk SND Collab.)
ACHASOV	03D	PR D68 052006	M.N. Achasov et al.	(Novosibirsk SND Collab.)
ALOISIO	03	PL B561 55	A. Aloisio et al.	(KLOE Collab.)
BENAYOUN	03	EPJ C29 397	M. Benayoun et al.	
ACHASOV	02E	PR D66 032001	M.N. Achasov et al.	(Novosibirsk SND Collab.)
ACHASOV	02F	PL B537 201	M.N. Achasov et al.	(Novosibirsk SND Collab.)
AKHMETSHIN	02	PL B527 161	R.R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
ALOISIO	02D	PL B537 21	A. Aloisio et al.	(KLOE Collab.)
HEISTER	02C	PL B528 19	A. Heister et al.	(ALEPH Collab.)
ACHASOV	01E	PR D63 072002	M.N. Achasov et al.	(Novosibirsk SND Collab.)
AKHMETSHIN	01B	PL B509 217	R.R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
BARBERIS	01	PL B507 14	D. Barberis et al.	
ACHASOV	00	EPJ C12 25	M.N. Achasov et al.	(Novosibirsk SND Collab.)
ACHASOV	00D	JETPL 72 282	M.N. Achasov et al.	(Novosibirsk SND Collab.)
		Translated from ZETFP 72 411.		
ACHASOV	00G	JETPL 71 355	M.N. Achasov et al.	(Novosibirsk SND Collab.)
		Translated from ZETFP 71 519.		
AKHMETSHIN	00C	PL B476 33	R.R. Akhmetshin et al.	(Novosibirsk CMD-2 Collab.)
AULCHENKO	00A	JETP 90 927	V.M. Aulchenko et al.	(Novosibirsk SND Collab.)
		Translated from ZETF 117 1067.		
CASE	00	PR D61 032002	T. Case et al.	(Crystal Barrel Collab.)
ACHASOV	99E	PL B462 365	M.N. Achasov et al.	(Novosibirsk SND Collab.)
GARDNER	99	PR D59 076002	S. Gardner, H.B. O'Connell	
BENAYOUN	98	EPJ C2 269	M. Benayoun et al.	(IPNP, NOVO, ADLD+)
ABELE	97E	PL B411 361	A. Abele et al.	(Crystal Barrel Collab.)
BENAYOUN	96	ZPHY C72 221	M. Benayoun et al.	(IPNP, NOVO)
PROKOSHKIN	95	SPD 40 273	Y.D. Prokoshkin, V.D. Samoilenko	(SERP)
		Translated from DANS 342 610.		

WURZINGER	95	PR C51 443	R. Wurzinger *et al.*	(BONN, ORSAY, SACL+)
ALDE	94B	PL B340 122	D.M. Alde *et al.*	(SERP, BELG, LANL, LAPP+)
AMSLER	94C	PL B327 425	C. Amsler *et al.*	(Crystal Barrel Collab.)
ALDE	93	PAN 56 1229	D.M. Alde *et al.*	(SERP, LAPP, LANL, BELG+)
		Translated from YAF 56 137.		
Also		ZPHY C61 35	D.M. Alde *et al.*	(SERP, LAPP, LANL, BELG+)
AMSLER	93B	PL B311 362	C. Amsler *et al.*	(Crystal Barrel Collab.)
WEIDENAUER	93	ZPHY C59 387	P. Weidenauer *et al.*	(ASTERIX Collab.)
ANTONELLI	92	ZPHY C56 15	A. Antonelli *et al.*	(DM2 Collab.)
DOLINSKY	91	PRPL 202 99	S.I. Dolinsky *et al.*	(NOVO)
WEIDENAUER	90	ZPHY C47 353	P. Weidenauer *et al.*	(ASTERIX Collab.)
DOLINSKY	89	ZPHY C42 511	S.I. Dolinsky *et al.*	(NOVO)
BITYUKOV	88B	SJNP 47 800	S.I. Bityukov *et al.*	(SERP)
		Translated from YAF 47 1258.		
DOLINSKY	88	SJNP 48 277	S.I. Dolinsky *et al.*	(NOVO)
		Translated from YAF 48 442.		
KURDADZE	88	JETPL 47 512	L.M. Kurdadze *et al.*	(NOVO)
		Translated from ZETFP 47 432.		
AULCHENKO	87	PL B186 432	V.M. Aulchenko *et al.*	(NOVO)
BARKOV	87	JETPL 46 164	L.M. Barkov *et al.*	(NOVO)
		Translated from ZETFP 46 132.		
KURDADZE	86	JETPL 43 643	L.M. Kurdadze *et al.*	(NOVO)
		Translated from ZETFP 43 497.		
BARKOV	85	NP B256 365	L.M. Barkov *et al.*	(NOVO)
DRUZHININ	84	PL 144B 136	V.P. Druzhinin *et al.*	(NOVO)
KURDADZE	83B	JETPL 36 274	A.M. Kurdadze *et al.*	(NOVO)
		Translated from ZETFP 36 221.		
DZHELYADIN	81B	PL 102B 296	R.I. Dzhelyadin *et al.*	(SERP)
CORDIER	80	NP B172 13	A. Cordier *et al.*	(LALO)
DZHELYADIN	80	PL 94B 548	R.I. Dzhelyadin *et al.*	(SERP)
ROOS	80	LNC 27 321	M. Roos, A. Pellinen	(HELS)
BENKHEIRI	79	NP B150 268	P. Benkheiri *et al.*	(EPOL, CERN, CDEF+)
DZHELYADIN	79	PL 84B 143	R.I. Dzhelyadin *et al.*	(SERP)
COOPER	78B	NP B146 1	A.M. Cooper *et al.*	(TATA, CERN, CDEF+)
QUENZER	78	PL 76B 512	A. Quenzer *et al.*	(LALO)
VANAPEL...	78	NP B133 245	G.W. van Apeldoorn *et al.*	(ZEEM)
WICKLUND	78	PR D17 1197	A.B. Wicklund *et al.*	(ANL)
ANDREWS	77	PRL 38 198	D.E. Andrews *et al.*	(ROCH)
GESSAROLI	77	NP B126 382	R. Gessaroli *et al.*	(BGNA, FIRZ, GENO+)
KEYNE	76	PR D14 28	J. Keyne *et al.*	(LOIC, SHMP)
Also		PR D8 2789	D.M. Binnie *et al.*	(LOIC, SHMP)
KALBFLEISCH	75	PR D11 987	G.R. Kalbfleisch, R.C. Strand, J.W. Chapman	(BNL+)
AGUILAR-...	72B	PR D6 29	M. Aguilar-Benitez *et al.*	(BNL)
APEL	72B	PL 41B 234	W.D. Apel *et al.*	(KARLK, KARLE, PISA)
BASILE	72B	Phil. Conf. 153	M. Basile *et al.*	(CERN)
BENAKSAS	72	PL 39B 289	D. Benaksas *et al.*	(ORSAY)
BENAKSAS	72B	PL 42B 507	D. Benaksas *et al.*	(ORSAY)
BENAKSAS	72C	PL 42B 511	D. Benaksas *et al.*	(ORSAY)
BORENSTEIN	72	PR D5 1559	S.R. Borenstein *et al.*	(BNL, MICH)
BROWN	72	PL 42B 117	R.M. Brown *et al.*	(ILL, ILLC)
DAKIN	72	PR D6 2321	J.T. Dakin *et al.*	(PRIN)
RATCLIFF	72	PL 38B 345	B.N. Ratcliff *et al.*	(SLAC)
ALVENSLEB...	71C	PRL 27 888	H. Alvensleben *et al.*	(DESY)
BALDIN	71	SJNP 13 758	A.B. Baldin *et al.*	(ITEP)
		Translated from YAF 13 1318.		
BEHREND	71	PRL 27 61	H.J. Behrend *et al.*	(ROCH, CORN, FNAL)
BIZZARRI	71	NP B27 140	R. Bizzarri *et al.*	(CERN, CDEF)
COYNE	71	NP B32 333	D.G. Coyne *et al.*	(LRL)
MOFFEIT	71	NP B29 349	K.C. Moffeit *et al.*	(LRL, UCB, SLAC+)
ABRAMOVI...	70	NP B20 209	M. Abramovich *et al.*	(CERN)
BIGGS	70B	PRL 24 1201	P.J. Biggs *et al.*	(DARE)
BIZZARRI	70	PRL 25 1385	R. Bizzarri *et al.*	(ROMA, SYRA)
ROOS	70	DNPL/R7 173	M. Roos	(CERN)
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AUGUSTIN	69D	PL 28B 513	J.E. Augustin *et al.*	(ORSAY)
BIZZARRI	69	NP B14 169	R. Bizzarri *et al.*	(CERN, CDEF)
DEINET	69B	PL 30B 426	W. Deinet *et al.*	(KARL, CERN)
JACQUET	69B	NC 63A 743	F. Jacquet *et al.*	(EPOL, BERG)
WILSON	69	Private Comm.	R. Wilson	(HARV)
Also		PR 178 2095	A.A. Wehmann *et al.*	(HARV, CASE, SLAC+)
ASTVACAT...	68	PL 27B 45	R.G. Astvatsaturov *et al.*	(JINR, MOSU)
BOLLINI	68C	NC 56A 531	D. Bollini *et al.*	(CERN, BGNA, STRB)
BARASH	67B	PR 156 1399	N. Barash *et al.*	(COLU)

FELDMAN	67C	PR 159 1219	M. Feldman *et al.*	(PENN)
DIGIUGNO	66B	NC 44A 1272	G. Di Giugno *et al.*	(NAPL, FRAS, TRST)
FLATTE	66	PR 145 1050	S.M. Flatte *et al.*	(LRL)
JAMES	66	PR 142 896	F.E. James, H.L. Kraybill	(YALE, BNL)
BARBARO-...	65	PRL 14 279	A. Barbaro-Galtieri, R.D. Tripp	(LRL)
BARMIN	64	JETP 18 1289	V.V. Barmin *et al.*	(ITEP)
		Translated from ZETF 45 1879.		
KRAEMER	64	PR 136 B496	R.W. Kraemer *et al.*	(JHU, NWES, WOOD)
BUSCHBECK	63	Siena Conf. 1 166	B. Buschbeck *et al.*	(VIEN, CERN, ANIK)