$f_0(1500)$

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

See also the mini-reviews on scalar mesons under $f_0(600)$ and on non-$q\overline{q}$ candidates. (See the index for the page number.)

$f_0(1500)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
1507± 5 OUR AVERAGE	Error includes scale factor of 1.2.				
1515±12		[1] BARBERIS	00A		450 $pp \to p_f \eta\eta p_s$
1511± 9		[1,2] BARBERIS	00C		450 $pp \to p_f 4\pi p_s$
1510± 8		[1] BARBERIS	00E		450 $pp \to p_f \eta\eta p_s$
1522±25		BERTIN	98	OBLX	0.05–0.405 $\overline{n}p \to \pi^+\pi^+\pi^-$
1449±20		[1] BERTIN	97C	OBLX	0.0 $\overline{p}p \to \pi^+\pi^-\pi^0$
1515±20		ABELE	96B	CBAR	0.0 $\overline{p}p \to \pi^0 K^0_L K^0_L$
1500±15		[3] AMSLER	95B	CBAR	0.0 $\overline{p}p \to 3\pi^0$
1505±15		[4] AMSLER	95C	CBAR	0.0 $\overline{p}p \to \eta\eta\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1489^{+8}_{-4}		[13] ANISOVICH	03	RVUE	
1490±30		[5] ABELE	01	CBAR	0.0 $\overline{p}d \to \pi^- 4\pi^0 p$
1497±10		[5] BARBERIS	99	OMEG	450 $pp \to p_s p_f K^+ K^-$
1502±10		[5] BARBERIS	99B	OMEG	450 $pp \to p_s p_f \pi^+\pi^-$
1502±12±10		[6] BARBERIS	99D	OMEG	450 $pp \to K^+K^-$, $\pi^+\pi^-$
1530±45		[5] BELLAZZINI	99	GAM4	450 $pp \to pp\pi^0\pi^0$
1505±18		[5] FRENCH	99		300 $pp \to p_f (K^+K^-) p_s$
1447±27		[7] KAMINSKI	99	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $\sigma\sigma$
1580±80		[5] ALDE	98	GAM4	100 $\pi^- p \to \pi^0\pi^0 n$
1499± 8		[1] ANISOVICH	98B	RVUE	Compilation
~ 1520		REYES	98	SPEC	800 $pp \to p_s p_f K^0_S K^0_S$
1510±20		[1] BARBERIS	97B	OMEG	450 $pp \to pp2(\pi^+\pi^-)$
~ 1475		FRABETTI	97D	E687	$D^\pm_s \to \pi^\mp\pi^\pm\pi^\pm$
~ 1505		ABELE	96	CBAR	0.0 $\overline{p}p \to 5\pi^0$
1500± 8		[1] ABELE	96C	RVUE	Compilation
1460±20	120	[5] AMELIN	96B	VES	37 $\pi^- A \to \eta\eta\pi^- A$
1500± 8		BUGG	96	RVUE	
1500±10		[8] AMSLER	95D	CBAR	0.0 $\overline{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$
1445± 5		[9] ANTINORI	95	OMEG	300,450 $pp \to pp2(\pi^+\pi^-)$
1497±30		[5] ANTINORI	95	OMEG	300,450 $pp \to pp\pi^+\pi^-$
~ 1505		BUGG	95	MRK3	$J/\psi \to \gamma\pi^+\pi^-\pi^+\pi^-$

1446± 5		[5] ABATZIS	94	OMEG	450 $pp \rightarrow pp2(\pi^+\pi^-)$
1545±25		[5] AMSLER	94E	CBAR	0.0 $\overline{p}p \rightarrow \pi^0\eta\eta'$
1520±25		[1,10] ANISOVICH	94	CBAR	0.0 $\overline{p}p \rightarrow 3\pi^0, \pi^0\eta\eta$
1505±20		[1,11] BUGG	94	RVUE	$\overline{p}p \rightarrow 3\pi^0, \eta\eta\pi^0, \eta\pi^0\pi^0$
1560±25		[5] AMSLER	92	CBAR	0.0 $\overline{p}p \rightarrow \pi^0\eta\eta$
1550±45±30		[5] BELADIDZE	92C	VES	36 $\pi^-\text{Be} \rightarrow \pi^-\eta'\eta\text{Be}$
1449± 4		[5] ARMSTRONG	89E	OMEG	300 $pp \rightarrow pp2(\pi^+\pi^-)$
1610±20		[5] ALDE	88	GAM4	300 $\pi^- N \rightarrow \pi^- N 2\eta$
∼ 1525		ASTON	88D	LASS	11 $K^- p \rightarrow K^0_S K^0_S \Lambda$
1570±20	600	[5] ALDE	87	GAM4	100 $\pi^- p \rightarrow 4\pi^0 n$
1575±45		[12] ALDE	86D	GAM4	100 $\pi^- p \rightarrow 2\eta n$
1568±33		[5] BINON	84C	GAM2	38 $\pi^- p \rightarrow \eta\eta' n$
1592±25		[5] BINON	83	GAM2	38 $\pi^- p \rightarrow 2\eta n$
1525± 5		[5] GRAY	83	DBC	0.0 $\overline{p}N \rightarrow 3\pi$

[1] T-matrix pole.
[2] Average between $\pi^+\pi^-2\pi^0$ and $2(\pi^+\pi^-)$.
[3] T-matrix pole, supersedes ANISOVICH 94.
[4] T-matrix pole, supersedes ANISOVICH 94 and AMSLER 92.
[5] Breit-Wigner mass.
[6] Supersedes BARBERIS 99 and BARBERIS 99B.
[7] T-matrix pole on sheet $--+$.
[8] T-matrix pole. Coupled-channel analysis of AMSLER 95B, AMSLER 95C, and AMSLER 94D.
[9] Supersedes ABATZIS 94, ARMSTRONG 89E. Breit-Wigner mass.
[10] From a simultaneous analysis of the annihilations $\overline{p}p \rightarrow 3\pi^0, \pi^0\eta\eta$.
[11] Reanalysis of ANISOVICH 94 data.
[12] From central value and spread of two solutions. Breit-Wigner mass.
[13] K-matrix pole from combined analysis of $\pi^- p \rightarrow \pi^0\pi^0 n$, $\pi^- p \rightarrow K\overline{K}n$, $\pi^+\pi^- \rightarrow \pi^+\pi^-$, $\overline{p}p \rightarrow \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$, $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, $K^0_S K^0_S\pi^0$, $K^+K^0_S\pi^-$ at rest, $\overline{p}n \rightarrow \pi^-\pi^-\pi^+$, $K^0_S K^-\pi^0$, $K^0_S K^0_S\pi^-$ at rest.

f_0(1500) WIDTH

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
109± 7 OUR AVERAGE					
110± 24		[14] BARBERIS	00A		450 $pp \rightarrow p_f\eta\eta p_s$
102± 18		[14,15] BARBERIS	00C		450 $pp \rightarrow p_f 4\pi p_s$
110± 16		[14] BARBERIS	00E		450 $pp \rightarrow p_f\eta\eta p_s$
108± 33		BERTIN	98	OBLX	0.05–0.405 $\overline{n}p \rightarrow \pi^+\pi^+\pi^-$
114± 30		[14] BERTIN	97C	OBLX	0.0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0$
105± 15		ABELE	96B	CBAR	0.0 $\overline{p}p \rightarrow \pi^0 K^0_L K^0_L$
120± 25		[16] AMSLER	95B	CBAR	0.0 $\overline{p}p \rightarrow 3\pi^0$
120± 30		[17] AMSLER	95C	CBAR	0.0 $\overline{p}p \rightarrow \eta\eta\pi^0$

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

102± 10		[27] ANISOVICH	03	RVUE	
140± 40		[18] ABELE	01	CBAR	0.0 $\overline{p}d \rightarrow \pi^- 4\pi^0 p$
104± 25		[18] BARBERIS	99	OMEG	450 $pp \rightarrow p_s p_f K^+ K^-$
131± 15		[18] BARBERIS	99B	OMEG	450 $pp \rightarrow p_s p_f \pi^+ \pi^-$
98± 18±16		[19] BARBERIS	99D	OMEG	450 $pp \rightarrow K^+ K^-$, $\pi^+ \pi^-$
160± 50		[18] BELLAZZINI	99	GAM4	450 $pp \rightarrow pp\pi^0\pi^0$
100± 33		[18] FRENCH	99		300 $pp \rightarrow p_f (K^+ K^-) p_s$
108± 46		[20] KAMINSKI	99	RVUE	$\pi\pi \rightarrow \pi\pi$, $K\overline{K}$, $\sigma\sigma$
280±100		[21] ALDE	98	GAM4	100 $\pi^- p \rightarrow \pi^0\pi^0 n$
130± 20		[14] ANISOVICH	98B	RVUE	Compilation
120± 35		[14] BARBERIS	97B	OMEG	450 $pp \rightarrow pp2(\pi^+\pi^-)$
∼ 100		FRABETTI	97D	E687	$D_s^\pm \rightarrow \pi^\mp\pi^\pm\pi^\pm$
∼ 169		ABELE	96	CBAR	0.0 $\overline{p}p \rightarrow 5\pi^0$
100± 30	120	[18] AMELIN	96B	VES	37 $\pi^- A \rightarrow \eta\eta\pi^- A$
132± 15		BUGG	96	RVUE	
154± 30		[22] AMSLER	95D	CBAR	0.0 $\overline{p}p \rightarrow \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$
65± 10		[23] ANTINORI	95	OMEG	300,450 $pp \rightarrow pp2(\pi^+\pi^-)$
199± 30		[18] ANTINORI	95	OMEG	300,450 $pp \rightarrow pp\pi^+\pi^-$
56± 12		[18] ABATZIS	94	OMEG	450 $pp \rightarrow pp2(\pi^+\pi^-)$
100± 40		[18] AMSLER	94E	CBAR	0.0 $\overline{p}p \rightarrow \pi^0\eta\eta'$
148^{+20}_{-25}		[14,24] ANISOVICH	94	CBAR	0.0 $\overline{p}p \rightarrow 3\pi^0, \pi^0\eta\eta$
150± 20		[14,25] BUGG	94	RVUE	$\overline{p}p \rightarrow 3\pi^0$, $\eta\eta\pi^0$, $\eta\pi^0\pi^0$
245± 50		[18] AMSLER	92	CBAR	0.0 $\overline{p}p \rightarrow \pi^0\eta\eta$
153± 67±50		[18] BELADIDZE	92C	VES	36 π^- Be $\rightarrow \pi^-\eta'\eta$Be
78± 18		[18] ARMSTRONG	89E	OMEG	300 $pp \rightarrow pp2(\pi^+\pi^-)$
170± 40		[18] ALDE	88	GAM4	300 $\pi^- N \rightarrow \pi^- N 2\eta$
150± 20	600	[18] ALDE	87	GAM4	100 $\pi^- p \rightarrow 4\pi^0 n$
265± 65		[26] ALDE	86D	GAM4	100 $\pi^- p \rightarrow 2\eta n$
260± 60		[18] BINON	84C	GAM2	38 $\pi^- p \rightarrow \eta\eta' n$
210± 40		[18] BINON	83	GAM2	38 $\pi^- p \rightarrow 2\eta n$
101± 13		[18] GRAY	83	DBC	0.0 $\overline{p}N \rightarrow 3\pi$

[14] T-matrix pole.
[15] Average between $\pi^+\pi^-2\pi^0$ and $2(\pi^+\pi^-)$.
[16] T-matrix pole, supersedes ANISOVICH 94.
[17] T-matrix pole, supersedes ANISOVICH 94 and AMSLER 92.
[18] Breit-Wigner width.
[19] Supersedes BARBERIS 99 and BARBERIS 99B.
[20] T-matrix pole on sheet $--+$.

[21] Breit-Wigner width.
[22] T-matrix pole. Coupled-channel analysis of AMSLER 95B, AMSLER 95C, and AMSLER 94D.
[23] Supersedes ABATZIS 94, ARMSTRONG 89E. Breit-Wigner mass.
[24] From a simultaneous analysis of the annihilations $\overline{p}p \to 3\pi^0, \pi^0\eta\eta$.
[25] Reanalysis of ANISOVICH 94 data.
[26] From central value and spread of two solutions. Breit-Wigner mass.
[27] K-matrix pole from combined analysis of $\pi^- p \to \pi^0\pi^0 n$, $\pi^- p \to K\overline{K}n$, $\pi^+\pi^- \to \pi^+\pi^-$, $\overline{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$, $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, $K^0_S K^0_S\pi^0$, $K^+K^0_S\pi^-$ at rest, $\overline{p}n \to \pi^-\pi^-\pi^+$, $K^0_S K^-\pi^0$, $K^0_S K^0_S\pi^-$ at rest.

f_0(1500) DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor
Γ_1	$\eta\eta'(958)$	(1.9±0.8) %	1.7
Γ_2	$\eta\eta$	(5.1±0.9) %	1.4
Γ_3	4π	(49.5±3.3) %	1.2
Γ_4	$4\pi^0$	seen	
Γ_5	$2\pi^+2\pi^-$	seen	
Γ_6	$2(\pi\pi)_{S\text{-wave}}$		
Γ_7	$\rho\rho$		
Γ_8	$\pi(1300)\pi$		
Γ_9	$a_1(1260)\pi$		
Γ_{10}	$\pi\pi$	(34.9±2.3) %	1.2
Γ_{11}	$\pi^+\pi^-$	seen	
Γ_{12}	$2\pi^0$	seen	
Γ_{13}	$K\overline{K}$	(8.6±1.0) %	1.1
Γ_{14}	$\gamma\gamma$	not seen	

CONSTRAINED FIT INFORMATION

An overall fit to 6 branching ratios uses 10 measurements and one constraint to determine 5 parameters. The overall fit has a $\chi^2 =$ 11.4 for 6 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	29			
x_3	−31	−52		
x_{10}	−5	11	−83	
x_{13}	6	33	−67	39
	x_1	x_2	x_3	x_{10}

$f_0(1500)$ Γ(i)Γ($\gamma\gamma$)/Γ(total)

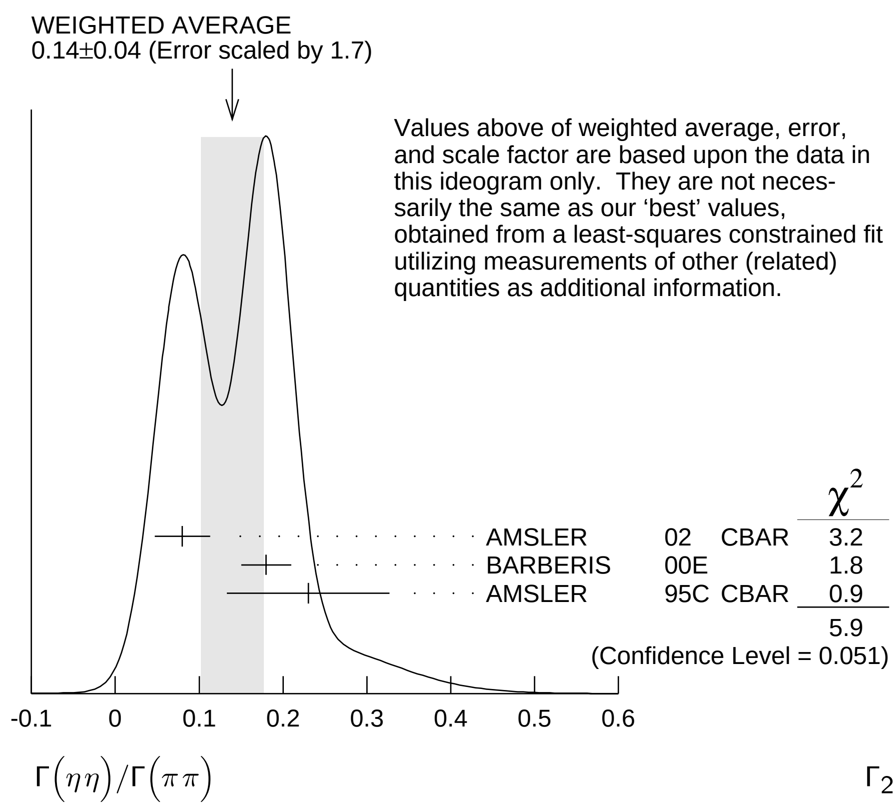
$\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{10}\Gamma_{14}/\Gamma$

VALUE (keV)	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
not seen		ACCIARRI	01H	L3	$\gamma\gamma \to K^0_S K^0_S$, E^{ee}_{cm}= 91, 183–209 GeV
<0.46	95	BARATE	00E	ALEP	$\gamma\gamma \to \pi^+\pi^-$

$f_0(1500)$ BRANCHING RATIOS

$\Gamma(\eta\eta)/\Gamma(\pi\pi)$ — Γ_2/Γ_{10}

VALUE	DOCUMENT ID		TECN	COMMENT
0.145±0.027 OUR FIT Error includes scale factor of 1.5.				
0.14 ±0.04 OUR AVERAGE Error includes scale factor of 1.7. See the ideogram below.				
0.080±0.033	AMSLER	02	CBAR	0.9 $\overline{p}p \to \pi^0\eta\eta$, $\pi^0\pi^0\pi^0$
0.18 ±0.03	BARBERIS	00E		450 $pp \to p_f \eta\eta p_s$
0.230±0.097	[28] AMSLER	95C	CBAR	0.0 $\overline{p}p \to \eta\eta\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.11 ±0.03	[29] ANISOVICH	02D	SPEC	Combined fit
0.078±0.013	[30] ABELE	96C	RVUE	Compilation
0.157±0.060	[31] AMSLER	95D	CBAR	0.0 $\overline{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$



$\Gamma(K\overline{K})/\Gamma(\eta\eta)$ — Γ_{13}/Γ_2

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
1.69±0.33 OUR FIT	Error includes scale factor of 1.4.			
1.85±0.41		BARBERIS 00E		450 $pp \to p_f \eta\eta p_s$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.5 ±0.6		[29] ANISOVICH 02D	SPEC	Combined fit
<0.4	90	[32] PROKOSHKIN 91	GAM4	300 $\pi^- p \to \pi^- p \eta\eta$
<0.6		[33] BINON 83	GAM2	38 $\pi^- p \to 2\eta n$

$\Gamma(K\overline{K})/\Gamma(\pi\pi)$ — Γ_{13}/Γ_{10}

VALUE	DOCUMENT ID	TECN	COMMENT
0.246±0.026 OUR FIT			
0.241±0.028 OUR AVERAGE			
0.25 ±0.03	[34] BARGIOTTI 03	OBLX	$\overline{p}p$
0.19 ±0.07	[35] ABELE 98	CBAR	0.0 $\overline{p}p \to K^0_L K^\pm \pi^\mp$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.16 ±0.05	[29] ANISOVICH 02D	SPEC	Combined fit
0.33 ±0.03 ±0.07	BARBERIS 99D	OMEG	450 $pp \to K^+K^-, \pi^+\pi^-$
0.20 ±0.08	[36] ABELE 96B	CBAR	0.0 $\overline{p}p \to \pi^0 K^0_L K^0_L$

$\Gamma(\eta\eta'(958))/\Gamma(\pi\pi)$ — Γ_1/Γ_{10}

VALUE	DOCUMENT ID	TECN	COMMENT
0.055±0.024 OUR FIT Error includes scale factor of 1.8.			
0.095±0.026	BARBERIS 00A		450 $pp \to p_f \eta\eta p_s$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.005±0.003	[29] ANISOVICH 02D	SPEC	Combined fit

$\Gamma(\eta\eta'(958))/\Gamma(\eta\eta)$ — Γ_1/Γ_2

VALUE	DOCUMENT ID	TECN	COMMENT
0.38±0.16 OUR FIT Error includes scale factor of 1.9.			
0.29±0.10	[37] AMSLER 95C	CBAR	0.0 $\overline{p}p \to \eta\eta\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.05±0.03	[29] ANISOVICH 02D	SPEC	Combined fit
0.84±0.23	ABELE 96C	RVUE	Compilation
2.7 ±0.8	BINON 84C	GAM2	38 $\pi^- p \to \eta\eta' n$

$\Gamma(\pi\pi)/\Gamma_{total}$ — Γ_{10}/Γ

VALUE	DOCUMENT ID	TECN
• • • We do not use the following data for averages, fits, limits, etc. • • •		
0.454±0.104	BUGG 96	RVUE

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

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
seen	BERTIN 98	OBLX	0.05–0.405 $\overline{n}p \to \pi^+\pi^+\pi^-$
possibly seen	FRABETTI 97D	E687	$D^\pm_s \to \pi^\mp\pi^\pm\pi^\pm$

$\Gamma(K\overline{K})/\Gamma_{total}$ — Γ_{13}/Γ

VALUE	DOCUMENT ID		TECN
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.044±0.021	BUGG	96	RVUE

$\Gamma(\eta\eta)/\Gamma_{total}$ — Γ_2/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
large	ALDE	88	GAM4	300 $\pi^- N \to \eta\eta\pi^- N$
large	BINON	83	GAM2	38 $\pi^- p \to 2\eta n$

$\Gamma(4\pi)/\Gamma(\pi\pi)$ — Γ_3/Γ_{10}

VALUE	DOCUMENT ID		TECN	COMMENT
1.42±0.18 OUR FIT Error includes scale factor of 1.2.				
1.42±0.18 OUR AVERAGE Error includes scale factor of 1.2.				
1.37±0.16	BARBERIS	00D		450 $pp \to p_f 4\pi p_s$
2.1 ±0.6	[38] AMSLER	98	RVUE	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.1 ±0.2	[29] ANISOVICH	02D	SPEC	Combined fit
3.4 ±0.8	[38] ABELE	96	CBAR	0.0 $\overline{p}p \to 5\pi^0$

$\Gamma(4\pi^0)/\Gamma(\eta\eta)$ — Γ_4/Γ_2

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.8±0.3	ALDE	87	GAM4	100 $\pi^- p \to 4\pi^0 n$

$\Gamma(\rho\rho)/\Gamma(2(\pi\pi)_{S\text{-wave}})$ — Γ_7/Γ_6

VALUE	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
3.3±0.5	BARBERIS	00C	450 $pp \to p_f \pi^+\pi^- 2\pi^0 p_s$
2.6±0.4	BARBERIS	00C	450 $pp \to p_f 2(\pi^+\pi^-) p_s$

$\Gamma(2(\pi\pi)_{S\text{-wave}})/\Gamma(\pi\pi)$ — Γ_6/Γ_{10}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.42±0.26	[39] ABELE	01	CBAR	0.0 $\overline{p}d \to \pi^- 4\pi^0 p$

$\Gamma(2(\pi\pi)_{S\text{-wave}})/\Gamma(4\pi)$ — Γ_6/Γ_3

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.26±0.07	ABELE	01B	CBAR	0.0 $\overline{p}n \to 5\pi$

$\Gamma(\rho\rho)/\Gamma(4\pi)$ — Γ_7/Γ_3

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.13±0.08	ABELE	01B	CBAR	0.0 $\overline{p}n \to 5\pi$

$\Gamma(\pi(1300)\pi)/\Gamma(4\pi)$ — Γ_8/Γ_3

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.50 ± 0.25	ABELE 01B	CBAR	0.0 $\overline{p}n \to 5\pi$

$\Gamma(a_1(1260)\pi)/\Gamma(4\pi)$ — Γ_9/Γ_3

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.12 ± 0.05	ABELE 01B	CBAR	0.0 $\overline{p}n \to 5\pi$

[28] Using AMSLER 95B ($3\pi^0$).
[29] From a combined K-matrix analysis of Crystal Barrel (0. $p\overline{p} \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$), GAMS ($\pi p \to \pi^0\pi^0 n$, $\eta\eta n$, $\eta\eta' n$), and BNL ($\pi p \to K\overline{K}n$) data.
[30] 2π width determined to be 60 ± 12 MeV.
[31] Coupled-channel analysis of AMSLER 95B, AMSLER 95C, and AMSLER 94D.
[32] Combining results of GAM4 with those of WA76 on $K\overline{K}$ central production.
[33] Using ETKIN 82B and COHEN 80.
[34] Coupled channel analysis of $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, and $K^\pm K^0_S\pi^\mp$.
[35] Using $\pi^0\pi^0$ from AMSLER 95B.
[36] Using AMSLER 95B ($3\pi^0$), AMSLER 94C ($2\pi^0\eta$) and SU(3).
[37] Using AMSLER 94E ($\eta\eta'\pi^0$).
[38] Excluding $\rho\rho$ contribution to 4π.
[39] From the combined data of ABELE 96 and ABELE 96C.

$f_0(1500)$ REFERENCES

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AMSLER 98 RMP 70 1293 C. Amsler
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BUGG	96	NP B471 59	D.V. Bugg, A.V. Sarantsev, B.S. Zou	(LOQM, PNPI)
AMSLER	95B	PL B342 433	C. Amsler *et al.*	(Crystal Barrel Collab.)
AMSLER	95C	PL B353 571	C. Amsler *et al.*	(Crystal Barrel Collab.)
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ANTINORI	95	PL B353 589	F. Antinori *et al.*	(ATHU, BARI, BIRM+)
BUGG	95	PL B353 378	D.V. Bugg *et al.*	(LOQM, PNPI, WASH)
ABATZIS	94	PL B324 509	S. Abatzis *et al.*	(ATHU, BARI, BIRM+)
AMSLER	94C	PL B327 425	C. Amsler *et al.*	(Crystal Barrel Collab.)
AMSLER	94D	PL B333 277	C. Amsler *et al.*	(Crystal Barrel Collab.)
AMSLER	94E	PL B340 259	C. Amsler *et al.*	(Crystal Barrel Collab.)
ANISOVICH	94	PL B323 233	V.V. Anisovich *et al.*	(Crystal Barrel Collab.)
BUGG	94	PR D50 4412	D.V. Bugg *et al.*	(LOQM)
AMSLER	92	PL B291 347	C. Amsler *et al.*	(Crystal Barrel Collab.)
BELADIDZE	92C	SJNP 55 1535 Translated from YAF 55 2748.	G.M. Beladidze, S.I. Bityukov, G.V. Borisov	(SERP+)
PROKOSHKIN	91	SPD 36 155 Translated from DANS 316 900.	Y.D. Prokoshkin	(GAM2, GAM4 Collab.)
ARMSTRONG	89E	PL B228 536	T.A. Armstrong, M. Benayoun	(ATHU, BARI, BIRM+)
ALDE	88	PL B201 160	D.M. Alde *et al.*	(SERP, BELG, LANL, LAPP+)
ASTON	88D	NP B301 525	D. Aston *et al.*	(SLAC, NAGO, CINC, INUS)
ALDE	87	PL B198 286	D.M. Alde *et al.*	(LANL, BRUX, SERP, LAPP)
ALDE	86D	NP B269 485	D.M. Alde *et al.*	(BELG, LAPP, SERP, CERN+)
BINON	84C	NC 80A 363	F.G. Binon *et al.*	(BELG, LAPP, SERP+)
BINON	83	NC 78A 313	F.G. Binon *et al.*	(BELG, LAPP, SERP+)
Also	83B	SJNP 38 561 Translated from YAF 38 934.	F.G. Binon *et al.*	(BELG, LAPP, SERP+)
GRAY	83	PR D27 307	L. Gray *et al.*	(SYRA)
ETKIN	82B	PR D25 1786	A. Etkin *et al.*	(BNL, CUNY, TUFTS, VAND)
COHEN	80	PR D22 2595	D. Cohen *et al.*	(ANL)

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