$f_0(980)$

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

See also the minireview on scalar mesons under $f_0(600)$. (See the index for the page number.)

$f_0(980)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
980 ±10 OUR ESTIMATE					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
981 ±43		[1] MENNESSIER	10	RVUE	Compilation
$1030 {}^{+30}_{-10}$		[2] ANISOVICH	09	RVUE	0.0 $\overline{p}p$, πN
$977 {}^{+11}_{-9} \pm 1$	44	[3] ECKLUND	09	CLEO	4.17 $e^+e^- \to D_s^- D_s^{*+}$ + c.c.
$982.2 \pm 1.0 {}^{+8.1}_{-8.0}$		[4] UEHARA	08A	BELL	10.6 $e^+e^- \to e^+e^-\pi^0\pi^0$
$976.8 \pm 0.3 {}^{+10.1}_{-0.6}$	64k	[5] AMBROSINO	07	KLOE	1.02 $e^+e^- \to \pi^0\pi^0\gamma$
$984.7 \pm 0.4 {}^{+2.4}_{-3.7}$	64k	[6] AMBROSINO	07	KLOE	1.02 $e^+e^- \to \pi^0\pi^0\gamma$
973 ± 3	262 ± 30	[7] AUBERT	07AK	BABR	10.6 $e^+e^- \to \phi\pi^+\pi^-\gamma$
970 ± 7	54 ± 9	[7] AUBERT	07AK	BABR	10.6 $e^+e^- \to \phi\pi^0\pi^0\gamma$
953 ±20	2.6k	[8] BONVICINI	07	CLEO	$D^+ \to \pi^-\pi^+\pi^+$
$985.6 {}^{+1.2}_{-1.5} {}^{+1.1}_{-1.6}$		[9] MORI	07	BELL	10.6 $e^+e^- \to e^+e^-\pi^+\pi^-$
$983.0 \pm 0.6 {}^{+4.0}_{-3.0}$		[10] AMBROSINO	06B	KLOE	1.02 $e^+e^- \to \pi^+\pi^-\gamma$
$977.3 \pm 0.9 {}^{+3.7}_{-4.3}$		[11] AMBROSINO	06B	KLOE	1.02 $e^+e^- \to \pi^+\pi^-\gamma$
950 ± 9	4286	[12] GARMASH	06	BELL	$B^+ \to K^+\pi^+\pi^-$
965 ±10		[13] ABLIKIM	05	BES2	$J/\psi \to \phi\pi^+\pi^-$, ϕK^+K^-
1031 ± 8		[14] ANISOVICH	03	RVUE	
1037 ±31		TIKHOMIROV	03	SPEC	40.0 $\pi^- C \to K_S^0 K_S^0 K_L^0 X$
973 ± 1	2438	[15] ALOISIO	02D	KLOE	$e^+e^- \to \pi^0\pi^0\gamma$
977 ± 3 ± 2	848	[16] AITALA	01A	E791	$D_s^+ \to \pi^-\pi^+\pi^+$
969.8 ± 4.5	419	[17] ACHASOV	00H	SND	$e^+e^- \to \pi^0\pi^0\gamma$
$985 {}^{+16}_{-12}$	419	[18,19] ACHASOV	00H	SND	$e^+e^- \to \pi^0\pi^0\gamma$
976 ± 5 ± 6		[20] AKHMETSHIN	99B	CMD2	$e^+e^- \to \pi^+\pi^-\gamma$
977 ± 3 ± 6	268	[20] AKHMETSHIN	99C	CMD2	$e^+e^- \to \pi^0\pi^0\gamma$
975 ± 4 ± 6		[21] AKHMETSHIN	99C	CMD2	$e^+e^- \to \pi^0\pi^0\gamma$
975 ± 4 ± 6		[22] AKHMETSHIN	99C	CMD2	$e^+e^- \to \pi^+\pi^-\gamma$, $\pi^0\pi^0\gamma$
985 ±10		BARBERIS	99	OMEG	450 $pp \to p_s p_f K^+K^-$

982 ± 3		BARBERIS	99B	OMEG	450 $p p \to p_s p_f \pi^+ \pi^-$
982 ± 3		BARBERIS	99C	OMEG	450 $p p \to p_s p_f \pi^0 \pi^0$
987 ± 6 ± 6		[23] BARBERIS	99D	OMEG	450 $p p \to K^+ K^-$, $\pi^+ \pi^-$
989 ±15		BELLAZZINI	99	GAM4	450 $p p \to p p \pi^0 \pi^0$
991 ± 3		[24] KAMINSKI	99	RVUE	$\pi \pi \to \pi \pi$, $K \overline{K}$, $\sigma \sigma$
∼ 980		[24] OLLER	99	RVUE	$\pi \pi \to \pi \pi$, $K \overline{K}$
∼ 993.5		OLLER	99B	RVUE	$\pi \pi \to \pi \pi$, $K \overline{K}$
∼ 987		[24] OLLER	99C	RVUE	$\pi \pi \to \pi \pi$, $K \overline{K}$, $\eta \eta$
957 ± 6		[25] ACKERSTAFF	98Q	OPAL	$Z \to f_0$ X
960 ±10		ALDE	98	GAM4	
1015 ±15		[24] ANISOVICH	98B	RVUE	Compilation
1008		[26] LOCHER	98	RVUE	$\pi \pi \to \pi \pi$, $K \overline{K}$
955 ±10		[25] ALDE	97	GAM2	450 $p p \to p p \pi^0 \pi^0$
994 ± 9		[27] BERTIN	97C	OBLX	0.0 $\overline{p} p \to \pi^+ \pi^- \pi^0$
993.2± 6.5± 6.9		[28] ISHIDA	96	RVUE	$\pi \pi \to \pi \pi$, $K \overline{K}$
1006		TORNQVIST	96	RVUE	$\pi \pi \to \pi \pi$, $K \overline{K}$, $K \pi$, $\eta \pi$
997 ± 5	3k	[29] ALDE	95B	GAM2	38 $\pi^- p \to \pi^0 \pi^0 n$
960 ±10	10k	[30] ALDE	95B	GAM2	38 $\pi^- p \to \pi^0 \pi^0 n$
994 ± 5		AMSLER	95B	CBAR	0.0 $\overline{p} p \to 3\pi^0$
∼ 996		[31] AMSLER	95D	CBAR	0.0 $\overline{p} p \to \pi^0 \pi^0 \pi^0$, $\pi^0 \eta \eta$, $\pi^0 \pi^0 \eta$
987 ± 6		[32] ANISOVICH	95	RVUE	
1015		JANSSEN	95	RVUE	$\pi \pi \to \pi \pi$, $K \overline{K}$
983		[33] BUGG	94	RVUE	$\overline{p} p \to \eta 2\pi^0$
973 ± 2		[34] KAMINSKI	94	RVUE	$\pi \pi \to \pi \pi$, $K \overline{K}$
988		[35] ZOU	94B	RVUE	
988 ±10		[36] MORGAN	93	RVUE	$\pi \pi (K \overline{K}) \to \pi \pi (K \overline{K})$, $J/\psi \to \phi \pi \pi (K \overline{K})$, $D_s \to \pi (\pi \pi)$
971.1± 4.0		[25] AGUILAR-...	91	EHS	400 $p p$
979 ± 4		[37] ARMSTRONG	91	OMEG	300 $p p \to p p \pi \pi$, $p p K \overline{K}$
956 ±12		BREAKSTONE	90	SFM	$p p \to p p \pi^+ \pi^-$
959.4± 6.5		[25] AUGUSTIN	89	DM2	$J/\psi \to \omega \pi^+ \pi^-$
978 ± 9		[25] ABACHI	86B	HRS	$e^+ e^- \to \pi^+ \pi^-$ X
$985.0^{+9.0}_{-39.0}$		ETKIN	82B	MPS	23 $\pi^- p \to n 2K^0_S$
974 ± 4		[37] GIDAL	81	MRK2	$J/\psi \to \pi^+ \pi^-$ X
975		[38] ACHASOV	80	RVUE	
986 ±10		[37] AGUILAR-...	78	HBC	0.7 $\overline{p} p \to K^0_S K^0_S$
969 ± 5		[37] LEEPER	77	ASPK	2–2.4 $\pi^- p \to \pi^+ \pi^- n$, $K^+ K^- n$
987 ± 7		[37] BINNIE	73	CNTR	$\pi^- p \to n$MM
1012 ± 6		[39] GRAYER	73	ASPK	17 $\pi^- p \to \pi^+ \pi^- n$
1007 ±20		[39] HYAMS	73	ASPK	17 $\pi^- p \to \pi^+ \pi^- n$
997 ± 6		[39] PROTOPOP...	73	HBC	7 $\pi^+ p \to \pi^+ p \pi^+ \pi^-$

[1] Average of the analyses of three data sets in the K-matrix model. Uses the data of BATLEY 08A, HYAMS 73, and GRAYER 74, partially of COHEN 80 or ETKIN 82B.
[2] On sheet II in a 2-pole solution. The other pole is found on sheet III at $(850-100i)$ MeV
[3] Using a relativistic Breit-Wigner function and taking into account the finite D_s mass.
[4] Breit-Wigner mass. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g^2_{f_0 KK}/g^2_{f_0 \pi\pi} = 0$.
[5] In the kaon-loop fit.
[6] In the no-structure fit.
[7] Systematic errors not estimated.
[8] FLATTE 76 parameterization. $g_{f_0 \pi\pi} = 329 \pm 96$ MeV/c^2 assuming $g_{f_0 K\overline{K}}/g_{f_0 \pi\pi}=2$.
[9] Breit-Wigner mass. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g^2_{f_0 KK}/g^2_{f_0 \pi\pi} = 4.21 \pm 0.25 \pm 0.21$ from ABLIKIM 05.
[10] In the kaon-loop fit following formalism of ACHASOV 89.
[11] In the no-structure fit assuming a direct coupling of ϕ to $f_0 \gamma$.
[12] FLATTE 76 parameterization. Supersedes GARMASH 05.
[13] FLATTE 76 parameterization, $g^2_{f_0 K\overline{K}}/g^2_{f_0 \pi\pi} = 4.21 \pm 0.25 \pm 0.21$.
[14] 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.
[15] From the negative interference with the $f_0(600)$ meson of AITALA 01B using the ACHASOV 89 parameterization for the $f_0(980)$, a Breit-Wigner for the $f_0(600)$, and ACHASOV 01F for the $\rho\pi$ contribution.
[16] Coupled-channel Breit-Wigner, couplings g_π=0.09±0.01±0.01, g_K=0.02±0.04±0.03.
[17] Supersedes ACHASOV 98I. Using the model of ACHASOV 89.
[18] Supersedes ACHASOV 98I.
[19] In the "narrow resonance" approximation.
[20] Assuming $\Gamma(f_0)$= 40 MeV.
[21] From a narrow pole fit taking into account $f_0(980)$ and $f_0(1200)$ intermediate mechanisms.
[22] From the combined fit of the photon spectra in the reactions $e^+e^- \rightarrow \pi^+\pi^-\gamma$, $\pi^0\pi^0\gamma$.
[23] Supersedes BARBERIS 99 and BARBERIS 99B
[24] T-matrix pole.
[25] From invariant mass fit.
[26] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(1039-93i)$ MeV.
[27] On sheet II in a 2 pole solution. The other pole is found on sheet III at (963-29i) MeV.
[28] Reanalysis of data from HYAMS 73, GRAYER 74, SRINIVASAN 75, and ROSSELET 77 using the interfering amplitude method.
[29] At high $|t|$.
[30] At low $|t|$.
[31] On sheet II in a 4-pole solution, the other poles are found on sheet III at $(953-55i)$ MeV and on sheet IV at $(938-35i)$ MeV.
[32] Combined fit of ALDE 95B, ANISOVICH 94, AMSLER 94D.
[33] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(996-103i)$ MeV.
[34] From sheet II pole position.
[35] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(797-185i)$ MeV and can be interpreted as a shadow pole.
[36] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(978-28i)$ MeV.
[37] From coupled channel analysis.
[38] Coupled channel analysis with finite width corrections.

[39] Included in AGUILAR-BENITEZ 78 fit.

$f_0(980)$ WIDTH

Width determination very model dependent. Peak width in $\pi\pi$ is about 50 MeV, but decay width can be much larger.

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
40 to 100 OUR ESTIMATE					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
36 ± 22		[40] MENNESSIER	10	RVUE	Compilation
$70 ^{+20}_{-32}$		[41] ANISOVICH	09	RVUE	0.0 $\overline{p}p$, πN
$91 ^{+30}_{-22} \pm 3$	44	[42] ECKLUND	09	CLEO	4.17 $e^+e^- \rightarrow D_s^- D_s^{*+}$ + c.c.
$66.9 \pm 2.2 ^{+17.6}_{-12.5}$		[43] UEHARA	08A	BELL	10.6 $e^+e^- \rightarrow e^+e^-\pi^0\pi^0$
65 ± 13	262 ± 30	[44] AUBERT	07AK	BABR	10.6 $e^+e^- \rightarrow \phi\pi^+\pi^-\gamma$
81 ± 21	54 ± 9	[44] AUBERT	07AK	BABR	10.6 $e^+e^- \rightarrow \phi\pi^0\pi^0\gamma$
$51.3 ^{+20.8}_{-17.7} {}^{+13.2}_{-3.8}$		[45] MORI	07	BELL	10.6 $e^+e^- \rightarrow e^+e^-\pi^+\pi^-$
$61 \pm 9 ^{+14}_{-8}$	2584	[46] GARMASH	05	BELL	$B^+ \rightarrow K^+\pi^+\pi^-$
64 ± 16		[47] ANISOVICH	03	RVUE	
121 ± 23		TIKHOMIROV	03	SPEC	40.0 $\pi^- C \rightarrow K_S^0 K_S^0 K_L^0 X$
~ 70		[48] BRAMON	02	RVUE	1.02 $e^+e^- \rightarrow \pi^0\pi^0\gamma$
$44 \pm 2 \pm 2$	848	[49] AITALA	01A	E791	$D_s^+ \rightarrow \pi^-\pi^+\pi^+$
201 ± 28	419	[50] ACHASOV	00H	SND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
122 ± 13	419	[51,52] ACHASOV	00H	SND	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
56 ± 20		[53] AKHMETSHIN	99C	CMD2	$e^+e^- \rightarrow \pi^0\pi^0\gamma$
65 ± 20		BARBERIS	99	OMEG	450 $pp \rightarrow p_s p_f K^+K^-$
80 ± 10		BARBERIS	99B	OMEG	450 $pp \rightarrow p_s p_f \pi^+\pi^-$
80 ± 10		BARBERIS	99C	OMEG	450 $pp \rightarrow p_s p_f \pi^0\pi^0$
$48 \pm 12 \pm 8$		[54] BARBERIS	99D	OMEG	450 $pp \rightarrow K^+K^-$, $\pi^+\pi^-$
65 ± 25		BELLAZZINI	99	GAM4	450 $pp \rightarrow pp\pi^0\pi^0$
71 ± 14		[55] KAMINSKI	99	RVUE	$\pi\pi \rightarrow \pi\pi$, $K\overline{K}$, $\sigma\sigma$
~ 28		[55] OLLER	99	RVUE	$\pi\pi \rightarrow \pi\pi$, $K\overline{K}$
~ 25		OLLER	99B	RVUE	$\pi\pi \rightarrow \pi\pi$, $K\overline{K}$
~ 14		[55] OLLER	99C	RVUE	$\pi\pi \rightarrow \pi\pi$, $K\overline{K}$, $\eta\eta$
70 ± 20		ALDE	98	GAM4	
86 ± 16		[55] ANISOVICH	98B	RVUE	Compilation
54		[56] LOCHER	98	RVUE	$\pi\pi \rightarrow \pi\pi$, $K\overline{K}$
69 ± 15		[57] ALDE	97	GAM2	450 $pp \rightarrow pp\pi^0\pi^0$

38 ± 20		[58] BERTIN	97C	OBLX	0.0 $\overline{p}p \to \pi^+\pi^-\pi^0$
∼ 100		[59] ISHIDA	96	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
34		TORNQVIST	96	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $K\pi$, $\eta\pi$
48 ± 10	3k	[60] ALDE	95B	GAM2	38 $\pi^- p \to \pi^0\pi^0 n$
95 ± 20	10k	[61] ALDE	95B	GAM2	38 $\pi^- p \to \pi^0\pi^0 n$
26 ± 10		AMSLER	95B	CBAR	0.0 $\overline{p}p \to 3\pi^0$
∼ 112		[62] AMSLER	95D	CBAR	0.0 $\overline{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$
80 ± 12		[63] ANISOVICH	95	RVUE	
30		JANSSEN	95	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
74		[64] BUGG	94	RVUE	$\overline{p}p \to \eta 2\pi^0$
29 ± 2		[65] KAMINSKI	94	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
46		[66] ZOU	94B	RVUE	
48 ± 12		[67] MORGAN	93	RVUE	$\pi\pi(K\overline{K}) \to \pi\pi(K\overline{K})$, $J/\psi \to \phi\pi\pi(K\overline{K})$, $D_s \to \pi(\pi\pi)$
37.4 ± 10.6		[57] AGUILAR-...	91	EHS	400 pp
72 ± 8		[68] ARMSTRONG	91	OMEG	300 $pp \to pp\pi\pi$, $ppK\overline{K}$
110 ± 30		BREAKSTONE	90	SFM	$pp \to pp\pi^+\pi^-$
29 ± 13		[57] ABACHI	86B	HRS	$e^+e^- \to \pi^+\pi^- X$
120 ±281 ±20		ETKIN	82B	MPS	23 $\pi^- p \to n 2K^0_S$
28 ± 10		[68] GIDAL	81	MRK2	$J/\psi \to \pi^+\pi^- X$
70 to 300		[69] ACHASOV	80	RVUE	
100 ± 80		[70] AGUILAR-...	78	HBC	0.7 $\overline{p}p \to K^0_S K^0_S$
30 ± 8		[68] LEEPER	77	ASPK	2–2.4 $\pi^- p \to \pi^+\pi^- n$, $K^+K^- n$
48 ± 14		[68] BINNIE	73	CNTR	$\pi^- p \to n$MM
32 ± 10		[71] GRAYER	73	ASPK	17 $\pi^- p \to \pi^+\pi^- n$
30 ± 10		[71] HYAMS	73	ASPK	17 $\pi^- p \to \pi^+\pi^- n$
54 ± 16		[71] PROTOPOP...	73	HBC	7 $\pi^+ p \to \pi^+ p \pi^+\pi^-$

[40] Average of the analyses of three data sets in the K-matrix model. Uses the data of BATLEY 08A, HYAMS 73, and GRAYER 74, partially of COHEN 80 or ETKIN 82B.

[41] On sheet II in a 2-pole solution. The other pole is found on sheet III at (850−100i) MeV

[42] Using a relativistic Breit-Wigner function and taking into account the finite D_s mass.

[43] Breit-Wigner $\pi\pi$ width. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g^2_{f_0 KK}/g^2_{f_0\pi\pi} = 0$.

[44] Systematic errors not estimated.

[45] Breit-Wigner $\pi\pi$ width. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g^2_{f_0 KK}/g^2_{f_0\pi\pi} = 4.21 \pm 0.25 \pm 0.21$ from ABLIKIM 05.

[46] Breit-Wigner, solution 1, PWA ambiguous.

[47] 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.

[48] Using the data of AKHMETSHIN 99C, ACHASOV 00H, and ALOISIO 02D.

[49] Breit-Wigner width.

[50] Supersedes ACHASOV 98I. Using the model of ACHASOV 89.
[51] Supersedes ACHASOV 98I.
[52] In the "narrow resonance" approximation.
[53] From the combined fit of the photon spectra in the reactions $e^+ e^- \rightarrow \pi^+ \pi^- \gamma$, $\pi^0 \pi^0 \gamma$.
[54] Supersedes BARBERIS 99 and BARBERIS 99B
[55] T-matrix pole.
[56] On sheet II in a 2 pole solution. The other pole is found on sheet III at (1039−93i) MeV.
[57] From invariant mass fit.
[58] On sheet II in a 2 pole solution. The other pole is found on sheet III at (963-29i) MeV.
[59] Reanalysis of data from HYAMS 73, GRAYER 74, SRINIVASAN 75, and ROSSELET 77 using the interfering amplitude method.
[60] At high $|t|$.
[61] At low $|t|$.
[62] On sheet II in a 4-pole solution, the other poles are found on sheet III at (953−55i) MeV and on sheet IV at (938−35i) MeV.
[63] Combined fit of ALDE 95B, ANISOVICH 94,
[64] On sheet II in a 2 pole solution. The other pole is found on sheet III at (996−103i) MeV.
[65] From sheet II pole position.
[66] On sheet II in a 2 pole solution. The other pole is found on sheet III at (797−185i) MeV and can be interpreted as a shadow pole.
[67] On sheet II in a 2 pole solution. The other pole is found on sheet III at (978−28i) MeV.
[68] From coupled channel analysis.
[69] Coupled channel analysis with finite width corrections.
[70] From coupled channel fit to the HYAMS 73 and PROTOPOPESCU 73 data. With a simultaneous fit to the $\pi\pi$ phase-shifts, inelasticity and to the $K^0_S K^0_S$ invariant mass.
[71] Included in AGUILAR-BENITEZ 78 fit.

$f_0(980)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\pi\pi$	dominant
Γ_2	$K\overline{K}$	seen
Γ_3	$\gamma\gamma$	seen
Γ_4	$e^+ e^-$	

$f_0(980)$ PARTIAL WIDTHS

$\Gamma(\gamma\gamma)$ Γ_3

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
$0.29^{+0.07}_{-0.06}$ OUR AVERAGE				
$0.286\pm0.017^{+0.211}_{-0.070}$	[72] UEHARA	08A	BELL	10.6 $e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$
$0.205^{+0.095}_{-0.083}{}^{+0.147}_{-0.117}$	[73] MORI	07	BELL	10.6 $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$
$0.28^{+0.09}_{-0.13}$	[74] BOGLIONE	99	RVUE	$\gamma\gamma \rightarrow \pi^+ \pi^-$, $\pi^0 \pi^0$
$0.42 \pm0.06 \pm0.18$	[75] OEST	90	JADE	$e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$

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

0.29 ±0.07 ±0.12	[76,77] BOYER	90	MRK2	$e^+e^- \to e^+e^-\pi^+\pi^-$
0.31 ±0.14 ±0.09	[76,77] MARSISKE	90	CBAL	$e^+e^- \to e^+e^-\pi^0\pi^0$
0.63 ±0.14	[78] MORGAN	90	RVUE	$\gamma\gamma \to \pi^+\pi^-$, $\pi^0\pi^0$

[72] Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g^2_{f_0 K K}/g^2_{f_0 \pi\pi} = 0$.

[73] Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g^2_{f_0 K K}/g^2_{f_0 \pi\pi} = 4.21 \pm 0.25 \pm 0.21$ from ABLIKIM 05.

[74] Supersedes MORGAN 90.

[75] OEST 90 quote systematic errors $^{+0.08}_{-0.18}$. We use ±0.18. Observed 60 events.

[76] From analysis allowing arbitrary background unconstrained by unitarity.

[77] Data included in MORGAN 90, BOGLIONE 99 analyses.

[78] From amplitude analysis of BOYER 90 and MARSISKE 90, data corresponds to resonance parameters m = 989 MeV, Γ = 61 MeV.

$\Gamma(e^+e^-)$ Γ_4

VALUE (eV)	CL%	DOCUMENT ID		TECN	COMMENT
<8.4	90	VOROBYEV	88	ND	$e^+e^- \to \pi^0\pi^0$

$f_0(980)$ BRANCHING RATIOS

$\Gamma(\pi\pi)/[\Gamma(\pi\pi)+\Gamma(K\overline{K})]$ $\Gamma_1/(\Gamma_1+\Gamma_2)$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.52±0.12	9.9k	[79] AUBERT	06O	BABR	$B^\pm \to K^\pm\pi^\pm\pi^\mp$
$0.75^{+0.11}_{-0.13}$		[80] ABLIKIM	05Q	BES2	$\chi_{c0} \to 2\pi^+2\pi^-$, $\pi^+\pi^-K^+K^-$
0.84±0.02		[81] ANISOVICH	02D	SPEC	Combined fit
∼ 0.68		OLLER	99B	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
0.67±0.09		[82] LOVERRE	80	HBC	4 $\pi^-p \to n2K^0_S$
$0.81^{+0.09}_{-0.04}$		[82] CASON	78	STRC	7 $\pi^-p \to n2K^0_S$
0.78±0.03		[82] WETZEL	76	OSPK	8.9 $\pi^-p \to n2K^0_S$

[79] Recalculated by us using $\Gamma(K^+K^-)$ / $\Gamma(\pi^+\pi^-) = 0.69 \pm 0.32$ from AUBERT 06O and isospin relations.

[80] Using data from ABLIKIM 04G.

[81] 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.

[82] Measure $\pi\pi$ elasticity assuming two resonances coupled to the $\pi\pi$ and $K\overline{K}$ channels only.

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