$f_0(980)$

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

See also the minireview on scalar mesons under $f_0(500)$. (See the index for the page number.)

$f_0(980)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
990 ±20 OUR ESTIMATE					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
989.9 ± 0.4	706	ABLIKIM	12E	BES3	$J/\psi \to \gamma 3\pi$
$1003 ^{+5}_{-27}$		[1,2] GARCIA-MAR..11		RVUE	Compilation
996 ± 7		[1,3] GARCIA-MAR..11		RVUE	Compilation
$996 ^{+4}_{-14}$		[4] MOUSSALLAM	11	RVUE	Compilation
981 ±43		[5] MENNESSIER	10	RVUE	Compilation
$1030 ^{+30}_{-10}$		[6] ANISOVICH	09	RVUE	0.0 $\overline{p}p$, πN
$977 ^{+11}_{-9} \pm 1$	44	[7] ECKLUND	09	CLEO	4.17 $e^+e^- \to D_s^- D_s^{*+}$ + c.c.
$982.2 \pm 1.0 ^{+8.1}_{-8.0}$		[8] UEHARA	08A	BELL	10.6 $e^+e^- \to e^+e^-\pi^0\pi^0$
$976.8 \pm 0.3 ^{+10.1}_{-0.6}$	64k	[9] AMBROSINO	07	KLOE	1.02 $e^+e^- \to \pi^0\pi^0\gamma$
$984.7 \pm 0.4 ^{+2.4}_{-3.7}$	64k	[10] AMBROSINO	07	KLOE	1.02 $e^+e^- \to \pi^0\pi^0\gamma$
973 ± 3	262 ± 30	[11] AUBERT	07AK	BABR	10.6 $e^+e^- \to \phi\pi^+\pi^-\gamma$
970 ± 7	54 ± 9	[11] AUBERT	07AK	BABR	10.6 $e^+e^- \to \phi\pi^0\pi^0\gamma$
953 ±20	2.6k	[12] BONVICINI	07	CLEO	$D^+ \to \pi^-\pi^+\pi^+$
$985.6 ^{+1.2}_{-1.5} {}^{+1.1}_{-1.6}$		[13] MORI	07	BELL	10.6 $e^+e^- \to e^+e^-\pi^+\pi^-$
$983.0 \pm 0.6 ^{+4.0}_{-3.0}$		[14] AMBROSINO	06B	KLOE	1.02 $e^+e^- \to \pi^+\pi^-\gamma$
$977.3 \pm 0.9 ^{+3.7}_{-4.3}$		[15] AMBROSINO	06B	KLOE	1.02 $e^+e^- \to \pi^+\pi^-\gamma$
950 ± 9	4286	[16] GARMASH	06	BELL	$B^+ \to K^+\pi^+\pi^-$
965 ±10		[17] ABLIKIM	05	BES2	$J/\psi \to \phi\pi^+\pi^-$, ϕK^+K^-
1031 ± 8		[18] 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	[19] ALOISIO	02D	KLOE	$e^+e^- \to \pi^0\pi^0\gamma$
977 ± 3 ± 2	848	[20] AITALA	01A	E791	$D_s^+ \to \pi^-\pi^+\pi^+$
969.8 ± 4.5	419	[21] ACHASOV	00H	SND	$e^+e^- \to \pi^0\pi^0\gamma$
$985 ^{+16}_{-12}$	419	[22,23] ACHASOV	00H	SND	$e^+e^- \to \pi^0\pi^0\gamma$
976 ± 5 ± 6		[24] AKHMETSHIN	99B	CMD2	$e^+e^- \to \pi^+\pi^-\gamma$
977 ± 3 ± 6	268	[24] AKHMETSHIN	99C	CMD2	$e^+e^- \to \pi^0\pi^0\gamma$

$975 \pm 4 \pm 6$		[25] AKHMETSHIN	99C	CMD2	$e^+ e^- \to \pi^0 \pi^0 \gamma$
$975 \pm 4 \pm 6$		[26] AKHMETSHIN	99C	CMD2	$e^+ e^- \to \pi^+ \pi^- \gamma$, $\pi^0 \pi^0 \gamma$
985 ± 10		BARBERIS	99	OMEG	$450\ p p \to p_s p_f K^+ K^-$
982 ± 3		BARBERIS	99B	OMEG	$450\ p p \to p_s p_f \pi^+ \pi^-$
982 ± 3		BARBERIS	99C	OMEG	$450\ p p \to p_s p_f \pi^0 \pi^0$
$987 \pm 6 \pm 6$		[27] 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		[28] KAMINSKI	99	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $\sigma\sigma$
~ 980		[28] 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		[28] OLLER	99C	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $\eta\eta$
957 ± 6		[29] ACKERSTAFF	98Q	OPAL	$Z \to f_0$ X
960 ± 10		ALDE	98	GAM4	
1015 ± 15		[28] ANISOVICH	98B	RVUE	Compilation
1008		[30] LOCHER	98	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
955 ± 10		[29] ALDE	97	GAM2	$450\ p p \to p p \pi^0 \pi^0$
994 ± 9		[31] BERTIN	97C	OBLX	$0.0\ \overline{p} p \to \pi^+ \pi^- \pi^0$
$993.2 \pm 6.5 \pm 6.9$		[32] 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	[33] ALDE	95B	GAM2	$38\ \pi^- p \to \pi^0 \pi^0 n$
960 ± 10	10k	[34] 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		[35] 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		[36] ANISOVICH	95	RVUE	
1015		JANSSEN	95	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
983		[37] BUGG	94	RVUE	$\overline{p} p \to \eta 2\pi^0$
973 ± 2		[38] KAMINSKI	94	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
988		[39] ZOU	94B	RVUE	
988 ± 10		[40] 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		[29] AGUILAR-...	91	EHS	$400\ p p$
979 ± 4		[41] 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		[29] AUGUSTIN	89	DM2	$J/\psi \to \omega \pi^+ \pi^-$
978 ± 9		[29] 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		[41] GIDAL	81	MRK2	$J/\psi \to \pi^+ \pi^-$ X
975		[42] ACHASOV	80	RVUE	
986 ± 10		[41] AGUILAR-...	78	HBC	$0.7\ \overline{p} p \to K^0_S K^0_S$
969 ± 5		[41] LEEPER	77	ASPK	$2\text{–}2.4\ \pi^- p \to \pi^+ \pi^- n$, $K^+ K^- n$
987 ± 7		[41] BINNIE	73	CNTR	$\pi^- p \to n$MM
1012 ± 6		[43] GRAYER	73	ASPK	$17\ \pi^- p \to \pi^+ \pi^- n$

1007	±20	[43] HYAMS	73	ASPK	17 $\pi^- p \to \pi^+ \pi^- n$
997	± 6	[43] PROTOPOP...	73	HBC	7 $\pi^+ p \to \pi^+ p \pi^+ \pi^-$

[1] Quoted number refers to real part of pole position.
[2] Analytic continuation using Roy equations. Uses the K_{e4} data of BATLEY 10C and the $\pi N \to \pi\pi N$ data of HYAMS 73, GRAYER 74, and PROTOPOPESCU 73.
[3] Analytic continuation using GKPY equations. Uses the K_{e4} data of BATLEY 10C and the $\pi N \to \pi\pi N$ data of HYAMS 73, GRAYER 74, and PROTOPOPESCU 73.
[4] Pole position. Used Roy equations.
[5] 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.
[6] On sheet II in a 2-pole solution. The other pole is found on sheet III at (850−100*i*) MeV
[7] Using a relativistic Breit-Wigner function and taking into account the finite D_s mass.
[8] Breit-Wigner mass. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g_{f_0 K K}/g_{f_0 \pi\pi} = 0$.
[9] In the kaon-loop fit.
[10] In the no-structure fit.
[11] Systematic errors not estimated.
[12] 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.
[13] Breit-Wigner mass. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g_{f_0 K K}/g_{f_0 \pi\pi} = 4.21 \pm 0.25 \pm 0.21$ from ABLIKIM 05.
[14] In the kaon-loop fit following formalism of ACHASOV 89.
[15] In the no-structure fit assuming a direct coupling of ϕ to $f_0\gamma$.
[16] FLATTE 76 parameterization. Supersedes GARMASH 05.
[17] FLATTE 76 parameterization, $g_{f_0 K\overline{K}}/g_{f_0 \pi\pi} = 4.21 \pm 0.25 \pm 0.21$.
[18] 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.
[19] From the negative interference with the $f_0(500)$ meson of AITALA 01B using the ACHASOV 89 parameterization for the $f_0(980)$, a Breit-Wigner for the $f_0(500)$, and ACHASOV 01F for the $\rho\pi$ contribution.
[20] Coupled-channel Breit-Wigner, couplings g_π=0.09±0.01±0.01, g_K=0.02±0.04±0.03.
[21] Supersedes ACHASOV 98I. Using the model of ACHASOV 89.
[22] Supersedes ACHASOV 98I.
[23] In the "narrow resonance" approximation.
[24] Assuming $\Gamma(f_0)$= 40 MeV.
[25] From a narrow pole fit taking into account $f_0(980)$ and $f_0(1200)$ intermediate mechanisms.
[26] From the combined fit of the photon spectra in the reactions $e^+e^- \to \pi^+\pi^-\gamma$, $\pi^0\pi^0\gamma$.
[27] Supersedes BARBERIS 99 and BARBERIS 99B
[28] T-matrix pole.
[29] From invariant mass fit.
[30] On sheet II in a 2 pole solution. The other pole is found on sheet III at (1039−93*i*) MeV.
[31] On sheet II in a 2 pole solution. The other pole is found on sheet III at (963-29i) MeV.
[32] Reanalysis of data from HYAMS 73, GRAYER 74, SRINIVASAN 75, and ROSSELET 77 using the interfering amplitude method.
[33] At high $|t|$.
[34] At low $|t|$.
[35] On sheet II in a 4-pole solution, the other poles are found on sheet III at (953−55*i*) MeV and on sheet IV at (938−35*i*) MeV.

[36] Combined fit of ALDE 95B, ANISOVICH 94, AMSLER 94D.
[37] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(996-103i)$ MeV.
[38] From sheet II pole position.
[39] 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.
[40] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(978-28i)$ MeV.
[41] From coupled channel analysis.
[42] Coupled channel analysis with finite width corrections.
[43] 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. • • •					
9.5 ± 1.1	706	ABLIKIM	12E	BES3	$J/\psi \to \gamma 3\pi$
$42\ ^{+20}_{-16}$		[1,2] GARCIA-MAR...	11	RVUE	Compilation
$50\ ^{+20}_{-12}$		[2,3] GARCIA-MAR...	11	RVUE	Compilation
$48\ ^{+22}_{-6}$		[4] MOUSSALLAM	11	RVUE	Compilation
36 ± 22		[5] MENNESSIER	10	RVUE	Compilation
$70\ ^{+20}_{-32}$		[6] ANISOVICH	09	RVUE	0.0 $\overline{p}p$, πN
$91\ ^{+30}_{-22}\pm 3$	44	[7] ECKLUND	09	CLEO	4.17 $e^+e^- \to D_s^- D_s^{*+}$ + c.c.
$66.9\pm 2.2^{+17.6}_{-12.5}$		[8] UEHARA	08A	BELL	10.6 $e^+e^- \to e^+e^-\pi^0\pi^0$
65 ± 13	262 ± 30	[9] AUBERT	07AK	BABR	10.6 $e^+e^- \to \phi\pi^+\pi^-\gamma$
81 ± 21	54 ± 9	[9] AUBERT	07AK	BABR	10.6 $e^+e^- \to \phi\pi^0\pi^0\gamma$
$51.3^{+20.8}_{-17.7}{}^{+13.2}_{-3.8}$		[10] MORI	07	BELL	10.6 $e^+e^- \to e^+e^-\pi^+\pi^-$
$61\pm 9\ ^{+14}_{-8}$	2584	[11] GARMASH	05	BELL	$B^+ \to K^+\pi^+\pi^-$
64 ± 16		[12] ANISOVICH	03	RVUE	
121 ± 23		TIKHOMIROV	03	SPEC	40.0 $\pi^- C \to K^0_S K^0_S K^0_L X$
~ 70		[13] BRAMON	02	RVUE	1.02 $e^+e^- \to \pi^0\pi^0\gamma$
$44\pm 2\pm 2$	848	[14] AITALA	01A	E791	$D_s^+ \to \pi^-\pi^+\pi^+$
201 ± 28	419	[15] ACHASOV	00H	SND	$e^+e^- \to \pi^0\pi^0\gamma$
122 ± 13	419	[16,17] ACHASOV	00H	SND	$e^+e^- \to \pi^0\pi^0\gamma$
56 ± 20		[18] AKHMETSHIN	99C	CMD2	$e^+e^- \to \pi^0\pi^0\gamma$
65 ± 20		BARBERIS	99	OMEG	450 $pp \to p_s p_f K^+K^-$
80 ± 10		BARBERIS	99B	OMEG	450 $pp \to p_s p_f \pi^+\pi^-$

80 ± 10		BARBERIS	99C	OMEG	450 $p p \to p_s p_f \pi^0 \pi^0$
48 ± 12 ± 8		[19] BARBERIS	99D	OMEG	450 $p p \to K^+ K^-$, $\pi^+ \pi^-$
65 ± 25		BELLAZZINI	99	GAM4	450 $p p \to p p \pi^0 \pi^0$
71 ± 14		[20] KAMINSKI	99	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $\sigma\sigma$
∼ 28		[20] OLLER	99	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
∼ 25		OLLER	99B	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
∼ 14		[20] OLLER	99C	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $\eta\eta$
70 ± 20		ALDE	98	GAM4	
86 ± 16		[20] ANISOVICH	98B	RVUE	Compilation
54		[21] LOCHER	98	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
69 ± 15		[22] ALDE	97	GAM2	450 $p p \to p p \pi^0 \pi^0$
38 ± 20		[23] BERTIN	97C	OBLX	0.0 $\overline{p} p \to \pi^+ \pi^- \pi^0$
∼ 100		[24] 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	[25] ALDE	95B	GAM2	38 $\pi^- p \to \pi^0 \pi^0 n$
95 ± 20	10k	[26] 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		[27] 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		[28] ANISOVICH	95	RVUE	
30		JANSSEN	95	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
74		[29] BUGG	94	RVUE	$\overline{p} p \to \eta 2\pi^0$
29 ± 2		[30] KAMINSKI	94	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
46		[31] ZOU	94B	RVUE	
48 ± 12		[32] 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		[22] AGUILAR-...	91	EHS	400 $p p$
72 ± 8		[33] ARMSTRONG	91	OMEG	300 $p p \to p p \pi\pi$, $p p K\overline{K}$
110 ± 30		BREAKSTONE	90	SFM	$p p \to p p \pi^+ \pi^-$
29 ± 13		[22] 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		[33] GIDAL	81	MRK2	$J/\psi \to \pi^+ \pi^- X$
70 to 300		[34] ACHASOV	80	RVUE	
100 ± 80		[35] AGUILAR-...	78	HBC	0.7 $\overline{p} p \to K^0_S K^0_S$
30 ± 8		[33] LEEPER	77	ASPK	2–2.4 $\pi^- p \to \pi^+ \pi^- n$, $K^+ K^- n$
48 ± 14		[33] BINNIE	73	CNTR	$\pi^- p \to n$MM
32 ± 10		[36] GRAYER	73	ASPK	17 $\pi^- p \to \pi^+ \pi^- n$
30 ± 10		[36] HYAMS	73	ASPK	17 $\pi^- p \to \pi^+ \pi^- n$
54 ± 16		[36] PROTOPOP...	73	HBC	7 $\pi^+ p \to \pi^+ p \pi^+ \pi^-$

[1] Analytic continuation using Roy equations. Uses the K_{e4} data of BATLEY 10C and the $\pi N \to \pi\pi N$ data of HYAMS 73, GRAYER 74, and PROTOPOPESCU 73.
[2] Quoted number refers to twice imaginary part of pole position.

[3] Analytic continuation using GKPY equations. Uses the K_{e4} data of BATLEY 10C and the $\pi N \to \pi\pi N$ data of HYAMS 73, GRAYER 74, and PROTOPOPESCU 73.
[4] Pole position. Used Roy equations.
[5] 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.
[6] On sheet II in a 2-pole solution. The other pole is found on sheet III at $(850-100i)$ MeV
[7] Using a relativistic Breit-Wigner function and taking into account the finite D_s mass.
[8] Breit-Wigner $\pi\pi$ width. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g_{f_0 KK}/g_{f_0 \pi\pi} = 0$.
[9] Systematic errors not estimated.
[10] Breit-Wigner $\pi\pi$ width. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g_{f_0 KK}/g_{f_0 \pi\pi} = 4.21 \pm 0.25 \pm 0.21$ from ABLIKIM 05.
[11] Breit-Wigner, solution 1, PWA ambiguous.
[12] 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.
[13] Using the data of AKHMETSHIN 99C, ACHASOV 00H, and ALOISIO 02D.
[14] Breit-Wigner width.
[15] Supersedes ACHASOV 98I. Using the model of ACHASOV 89.
[16] Supersedes ACHASOV 98I.
[17] In the "narrow resonance" approximation.
[18] From the combined fit of the photon spectra in the reactions $e^+e^- \to \pi^+\pi^-\gamma$, $\pi^0\pi^0\gamma$.
[19] Supersedes BARBERIS 99 and BARBERIS 99B
[20] T-matrix pole.
[21] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(1039-93i)$ MeV.
[22] From invariant mass fit.
[23] On sheet II in a 2 pole solution. The other pole is found on sheet III at (963-29i) MeV.
[24] Reanalysis of data from HYAMS 73, GRAYER 74, SRINIVASAN 75, and ROSSELET 77 using the interfering amplitude method.
[25] At high $|t|$.
[26] At low $|t|$.
[27] 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.
[28] Combined fit of ALDE 95B, ANISOVICH 94,
[29] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(996-103i)$ MeV.
[30] From sheet II pole position.
[31] 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.
[32] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(978-28i)$ MeV.
[33] From coupled channel analysis.
[34] Coupled channel analysis with finite width corrections.
[35] 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.
[36] 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				
$0.286\pm0.017^{+0.211}_{-0.070}$	[1] UEHARA	08A	BELL	10.6 $e^+e^- \to e^+e^-\pi^0\pi^0$
$0.205^{+0.095}_{-0.083}{}^{+0.147}_{-0.117}$	[2] MORI	07	BELL	10.6 $e^+e^- \to e^+e^-\pi^+\pi^-$
$0.28\ ^{+0.09}_{-0.13}$	[3] BOGLIONE	99	RVUE	$\gamma\gamma\to\pi^+\pi^-$, $\pi^0\pi^0$
$0.42\ \pm0.06\ \pm0.18$	[4] OEST	90	JADE	$e^+e^- \to e^+e^-\pi^0\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.16\ \pm0.01$	[5] MENNESSIER	11	RVUE	
$0.29\ \pm0.21\ ^{+0.02}_{-0.07}$	[6] MOUSSALLAM	11	RVUE	Compilation
0.42	[7,8] PENNINGTON	08	RVUE	Compilation
0.10	[8,9] PENNINGTON	08	RVUE	Compilation
$0.29\ \pm0.07\ \pm0.12$	[10,11] BOYER	90	MRK2	$e^+e^- \to e^+e^-\pi^+\pi^-$
$0.31\ \pm0.14\ \pm0.09$	[10,11] MARSISKE	90	CBAL	$e^+e^- \to e^+e^-\pi^0\pi^0$
$0.63\ \pm0.14$	[12] MORGAN	90	RVUE	$\gamma\gamma\to\pi^+\pi^-$, $\pi^0\pi^0$

[1] Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g_{f_0 KK}/g_{f_0\pi\pi} = 0$.

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

[3] Supersedes MORGAN 90.

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

[5] Uses an analytic K-matrix model. Compilation.

[6] Using dispersion integral with phase input from Roy equations and data from MARSISKE 90, BOYER 90, BEHREND 92, UEHARA 08A, and MORI 07.

[7] Solution A (preferred solution based on χ^2-analysis).

[8] Dispersion theory based amplitude analysis of BOYER 90, MARSISKE 90, BEHREND 92, and MORI 07.

[9] Solution B (worse than solution A; still acceptable when systematic uncertainties are included).

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

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

[12] From amplitude analysis of BOYER 90 and MARSISKE 90, data corresponds to resonance parameters $m = 989$ MeV, $\Gamma = 61$ 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	[1] AUBERT	06O	BABR	$B^\pm \to K^\pm\pi^\pm\pi^\mp$
$0.75^{+0.11}_{-0.13}$		[2] ABLIKIM	05Q	BES2	$\chi_{c0} \to 2\pi^+2\pi^-$, $\pi^+\pi^-K^+K^-$
0.84 ± 0.02		[3] ANISOVICH	02D	SPEC	Combined fit
~ 0.68		OLLER	99B	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
0.67 ± 0.09		[4] LOVERRE	80	HBC	$4\ \pi^-p \to n2K^0_S$
$0.81^{+0.09}_{-0.04}$		[4] CASON	78	STRC	$7\ \pi^-p \to n2K^0_S$
0.78 ± 0.03		[4] WETZEL	76	OSPK	$8.9\ \pi^-p \to n2K^0_S$

[1] Recalculated by us using $\Gamma(K^+K^-)\ /\ \Gamma(\pi^+\pi^-) = 0.69\pm0.32$ from AUBERT 06O and isospin relations.

[2] Using data from ABLIKIM 04G.

[3] 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.

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

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