Citation: K. Hagiwara *et al.* (Particle Data Group), Phys. Rev. D **66**, 010001 (2002) (URL: http://pdg.lbl.gov)

$f_0(980)$

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

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. • • •					
977 ± 3 ±2	848	[1] AITALA	01A	E791	$D_s^+ \to \pi^- \pi^+ \pi^+$
969.8± 4.5	419	[2] ACHASOV	00H	SND	$e^+ e^- \to \pi^0 \pi^0 \gamma$
985 $^{+16}_{-12}$	419	[3,4] ACHASOV	00H	SND	$e^+ e^- \to \pi^0 \pi^0 \gamma$
976 ± 5 ±6		[5] AKHMETSHIN	99B	CMD2	$e^+ e^- \to \pi^+ \pi^- \gamma$
977 ± 3 ±6	268	[5] AKHMETSHIN	99C	CMD2	$e^+ e^- \to \pi^0 \pi^0 \gamma$
975 ± 4 ±6		[6] AKHMETSHIN	99C	CMD2	$e^+ e^- \to \pi^0 \pi^0 \gamma$
975 ± 4 ±6		[7] 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 ± 6 ±6		[8] 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		[9] KAMINSKI	99	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $\sigma\sigma$
∼ 980		[9] 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		[9] OLLER	99C	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $\eta\eta$
957 ± 6		[10] ACKERSTAFF	98Q	OPAL	$Z \to f_0$ X
960 ±10		ALDE	98	GAM4	
1015 ±15		[9] ANISOVICH	98B	RVUE	Compilation
1008		[11] LOCHER	98	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
955 ±10		[10] ALDE	97	GAM2	450 $p p \to p p \pi^0 \pi^0$
994 ± 9		[12] BERTIN	97C	OBLX	0.0 $\overline{p} p \to \pi^+ \pi^- \pi^0$
993.2± 6.5±6.9		[13] 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	[14] ALDE	95B	GAM2	38 $\pi^- p \to \pi^0 \pi^0 n$
960 ±10	10k	[15] 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		[16] 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		[17] ANISOVICH	95	RVUE	
1015		JANSSEN	95	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$

983		[18] BUGG	94	RVUE	$\overline{p}p \rightarrow \eta 2\pi^0$
973	$\pm$ 2	[19] KAMINSKI	94	RVUE	$\pi\pi \rightarrow \pi\pi,\ K\overline{K}$
988		[20] ZOU	94B	RVUE	
988	$\pm$10	[21] MORGAN	93	RVUE	$\pi\pi(K\overline{K}) \rightarrow \pi\pi(K\overline{K}),\ J/\psi \rightarrow \phi\pi\pi(K\overline{K}),\ D_s \rightarrow \pi(\pi\pi)$
971.1	$\pm$ 4.0	[10] AGUILAR-...	91	EHS	400 pp
979	$\pm$ 4	[22] ARMSTRONG	91	OMEG	300 $pp \rightarrow pp\pi\pi,\ ppK\overline{K}$
956	$\pm$12	BREAKSTONE	90	SFM	$pp \rightarrow pp\pi^+\pi^-$
959.4	$\pm$ 6.5	[10] AUGUSTIN	89	DM2	$J/\psi \rightarrow \omega\pi^+\pi^-$
978	$\pm$ 9	[10] ABACHI	86B	HRS	$e^+e^- \rightarrow \pi^+\pi^- X$
985.0	$^{+\ 9.0}_{-39.0}$	ETKIN	82B	MPS	23 $\pi^- p \rightarrow n2K^0_S$
974	$\pm$ 4	[22] GIDAL	81	MRK2	$J/\psi \rightarrow \pi^+\pi^- X$
975		[23] ACHASOV	80	RVUE	
986	$\pm$10	[22] AGUILAR-...	78	HBC	0.7 $\overline{p}p \rightarrow K^0_S K^0_S$
969	$\pm$ 5	[22] LEEPER	77	ASPK	2–2.4 $\pi^- p \rightarrow \pi^+\pi^- n,\ K^+K^- n$
987	$\pm$ 7	[22] BINNIE	73	CNTR	$\pi^- p \rightarrow n$MM
1012	$\pm$ 6	[24] GRAYER	73	ASPK	17 $\pi^- p \rightarrow \pi^+\pi^- n$
1007	$\pm$20	[24] HYAMS	73	ASPK	17 $\pi^- p \rightarrow \pi^+\pi^- n$
997	$\pm$ 6	[24] PROTOPOP...	73	HBC	7 $\pi^+ p \rightarrow \pi^+ p\pi^+\pi^-$

[1] Coupled-channel Breit-Wigner, couplings g_π=0.09$\pm$0.01$\pm$0.01, g_K=0.02$\pm$0.04$\pm$0.03.
[2] Supersedes ACHASOV 98I. Using the model of ACHASOV 89.
[3] Supersedes ACHASOV 98I.
[4] In the “narrow resonance” approximation.
[5] Assuming $\Gamma(f_0)$= 40 MeV.
[6] From a narrow pole fit taking into account $f_0(980)$ and $f_0(1200)$ intermediate mechanisms.
[7] From the combined fit of the photon spectra in the reactions $e^+e^- \rightarrow \pi^+\pi^-\gamma$, $\pi^0\pi^0\gamma$.
[8] Supersedes BARBERIS 99 and BARBERIS 99B
[9] T-matrix pole.
[10] From invariant mass fit.
[11] On sheet II in a 2 pole solution. The other pole is found on sheet III at (1039$-$93i) MeV.
[12] On sheet II in a 2 pole solution. The other pole is found on sheet III at (963-29i) MeV.
[13] Reanalysis of data from HYAMS 73, GRAYER 74, SRINIVASAN 75, and ROSSELET 77 using the interfering amplitude method.
[14] At high $|t|$.
[15] At low $|t|$.
[16] On sheet II in a 4-pole solution, the other poles are found on sheet III at (953$-$55i) MeV and on sheet IV at (938$-$35i) MeV.
[17] Combined fit of ALDE 95B, ANISOVICH 94, AMSLER 94D.
[18] On sheet II in a 2 pole solution. The other pole is found on sheet III at (996$-$ 103i) MeV.
[19] From sheet II pole position.
[20] 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.
[21] On sheet II in a 2 pole solution. The other pole is found on sheet III at (978$-$ 28i) MeV.
[22] From coupled channel analysis.
[23] Coupled channel analysis with finite width corrections.
[24] 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. • • •				
44 ± 2 ± 2	848	[25] AITALA 01A	E791	$D_s^+ \to \pi^- \pi^+ \pi^+$
201 ± 28	419	[26] ACHASOV 00H	SND	$e^+ e^- \to \pi^0 \pi^0 \gamma$
122 ± 13	419	[27,28] ACHASOV 00H	SND	$e^+ e^- \to \pi^0 \pi^0 \gamma$
56 ± 20		[29] AKHMETSHIN 99C	CMD2	$e^+ e^- \to \pi^0 \pi^0 \gamma$
65 ± 20		BARBERIS 99	OMEG	450 $p p \to p_s p_f K^+ K^-$
80 ± 10		BARBERIS 99B	OMEG	450 $p p \to p_s p_f \pi^+ \pi^-$
80 ± 10		BARBERIS 99C	OMEG	450 $p p \to p_s p_f \pi^0 \pi^0$
48 ± 12 ± 8		[30] 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		[31] KAMINSKI 99	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $\sigma\sigma$
~ 28		[31] OLLER 99	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
~ 25		OLLER 99B	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
~ 14		[31] OLLER 99C	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$, $\eta\eta$
70 ± 20		ALDE 98	GAM4	
86 ± 16		[31] ANISOVICH 98B	RVUE	Compilation
54		[32] LOCHER 98	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
69 ± 15		[33] ALDE 97	GAM2	450 $p p \to p p \pi^0 \pi^0$
38 ± 20		[34] BERTIN 97C	OBLX	0.0 $\overline{p} p \to \pi^+ \pi^- \pi^0$
~ 100		[35] 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	[36] ALDE 95B	GAM2	38 $\pi^- p \to \pi^0 \pi^0 n$
95 ± 20	10k	[37] 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		[38] 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		[39] ANISOVICH 95	RVUE	
30		JANSSEN 95	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
74		[40] BUGG 94	RVUE	$\overline{p} p \to \eta 2\pi^0$
29 ± 2		[41] KAMINSKI 94	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
46		[42] ZOU 94B	RVUE	
48 ± 12		[43] 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		[33] AGUILAR-... 91	EHS	400 $p p$
72 ± 8		[44] 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	[33] 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	[44] GIDAL	81	MRK2	$J/\psi \to \pi^+ \pi^- X$
70 to 300	[45] ACHASOV	80	RVUE	
100 ± 80	[46] AGUILAR-...	78	HBC	$0.7\ \overline{p} p \to K^0_S K^0_S$
30 ± 8	[44] LEEPER	77	ASPK	$2\text{–}2.4\ \pi^- p \to \pi^+ \pi^- n,\ K^+ K^- n$
48 ± 14	[44] BINNIE	73	CNTR	$\pi^- p \to n MM$
32 ± 10	[47] GRAYER	73	ASPK	$17\ \pi^- p \to \pi^+ \pi^- n$
30 ± 10	[47] HYAMS	73	ASPK	$17\ \pi^- p \to \pi^+ \pi^- n$
54 ± 16	[47] PROTOPOP...	73	HBC	$7\ \pi^+ p \to \pi^+ p \pi^+ \pi^-$

[25] Breit-Wigner width.
[26] Supersedes ACHASOV 98I. Using the model of ACHASOV 89.
[27] Supersedes ACHASOV 98I.
[28] In the "narrow resonance" approximation.
[29] From the combined fit of the photon spectra in the reactions $e^+ e^- \to \pi^+ \pi^- \gamma$, $\pi^0 \pi^0 \gamma$.
[30] Supersedes BARBERIS 99 and BARBERIS 99B
[31] T-matrix pole.
[32] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(1039-93i)$ MeV.
[33] From invariant mass fit.
[34] On sheet II in a 2 pole solution. The other pole is found on sheet III at (963-29i) MeV.
[35] Reanalysis of data from HYAMS 73, GRAYER 74, SRINIVASAN 75, and ROSSELET 77 using the interfering amplitude method.
[36] At high $|t|$.
[37] At low $|t|$.
[38] 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.
[39] Combined fit of ALDE 95B, ANISOVICH 94,
[40] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(996-103i)$ MeV.
[41] From sheet II pole position.
[42] 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.
[43] On sheet II in a 2 pole solution. The other pole is found on sheet III at $(978-28i)$ MeV.
[44] From coupled channel analysis.
[45] Coupled channel analysis with finite width corrections.
[46] 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.
[47] Included in AGUILAR-BENITEZ 78 fit.

$f_0(980)$ DECAY MODES

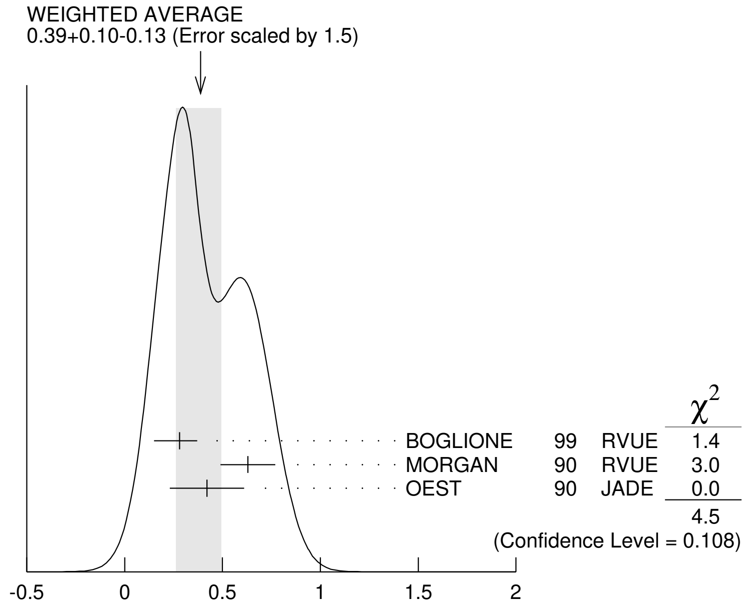
	Mode	Fraction (Γ_i/Γ)
Γ_1	$\pi\pi$	dominant
Γ_2	$K\overline{K}$	seen
Γ_3	$\gamma\gamma$	
Γ_4	$e^+ e^-$	

$f_0(980)$ PARTIAL WIDTHS

$\Gamma(\gamma\gamma)$ — Γ_3

VALUE (keV)	EVTS	DOCUMENT ID		TECN	COMMENT
$0.39^{+0.10}_{-0.13}$ OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.			
$0.28^{+0.09}_{-0.13}$		[48] BOGLIONE	99	RVUE	$\gamma\gamma \to \pi^+\pi^-$, $\pi^0\pi^0$
0.63 ± 0.14		[49] MORGAN	90	RVUE	$\gamma\gamma \to \pi^+\pi^-$, $\pi^0\pi^0$
$0.42 \pm 0.06 \pm 0.18$	60	[50] OEST	90	JADE	$e^+e^- \to e^+e^-\pi^0\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.29 \pm 0.07 \pm 0.12$		[51,52] BOYER	90	MRK2	$e^+e^- \to e^+e^-\pi^+\pi^-$
$0.31 \pm 0.14 \pm 0.09$		[51,52] MARSISKE	90	CBAL	$e^+e^- \to e^+e^-\pi^0\pi^0$

[48] Supersedes MORGAN 90.
[49] From amplitude analysis of BOYER 90 and MARSISKE 90, data corresponds to resonance parameters $m = 989$ MeV, $\Gamma = 61$ MeV.
[50] OEST 90 quote systematic errors $^{+0.08}_{-0.18}$. We use ± 0.18.
[51] From analysis allowing arbitrary background unconstrained by unitarity.
[52] Data included in MORGAN 90, BOGLIONE 99 analyses.



$\Gamma(\gamma\gamma)$ — Γ_3

$\Gamma(e^+e^-)$ — 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

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

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
~ 0.68	OLLER	99B	RVUE	$\pi\pi \to \pi\pi$, $K\overline{K}$
0.67 ± 0.09	[53] LOVERRE	80	HBC	$4\ \pi^- p \to n 2K^0_S$
$0.81^{+0.09}_{-0.04}$	[53] CASON	78	STRC	$7\ \pi^- p \to n 2K^0_S$
0.78 ± 0.03	[53] WETZEL	76	OSPK	$8.9\ \pi^- p \to n 2K^0_S$

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

$f_0(980)$ REFERENCES

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AKHMETSHIN	99B	PL B462 371	R.R. Akhmetshin *et al.*	(Novosibirsk CMD-2 Collab.)
AKHMETSHIN	99C	PL B462 380	R.R. Akhmetshin *et al.*	(Novosibirsk CMD-2 Collab.)
BARBERIS	99	PL B453 305	D. Barberis *et al.*	(Omega expt.)
BARBERIS	99B	PL B453 316	D. Barberis *et al.*	(Omega expt.)
BARBERIS	99C	PL B453 325	D. Barberis *et al.*	(Omega expt.)
BARBERIS	99D	PL B462 462	D. Barberis *et al.*	(Omega expt.)
BELLAZZINI	99	PL B467 296	R. Bellazzini *et al.*	
BOGLIONE	99	EPJ C9 11	M. Boglione, M.R. Pennington	
KAMINSKI	99	EPJ C9 141	R. Kaminski, L. Lesniak, B. Loiseau	(CRAC, PARIN)
OLLER	99	PR D60 099906 (erratum)	J.A. Oller *et al.*	
OLLER	99B	NP A652 407 (erratum)	J.A. Oller, E. Oset	
OLLER	99C	PR D60 074023	J.A. Oller, E. Oset	
ACHASOV	98I	PL B440 442	M.N. Achasov *et al.*	
ACKERSTAFF	98Q	EPJ C4 19	K. Ackerstaff *et al.*	(OPAL Collab.)
ALDE	98	EPJ A3 361	D. Alde *et al.*	(GAM4 Collab.)
Also	99	PAN 62 405 Translated from YAF 62 446.	D. Alde *et al.*	(GAMS Collab.)
ANISOVICH	98B	UFN 41 419	V.V. Anisovich *et al.*	
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AMSLER	95B	PL B342 433	C. Amsler *et al.*	(Crystal Barrel Collab.)
AMSLER	95D	PL B355 425	C. Amsler *et al.*	(Crystal Barrel Collab.)
ANISOVICH	95	PL B355 363	V.V. Anisovich *et al.*	(PNPI, SERP)
JANSSEN	95	PR D52 2690	G. Janssen *et al.*	(STON, ADLD, JULI)
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ANISOVICH	94	PL B323 233	V.V. Anisovich *et al.*	(Crystal Barrel Collab.)
BUGG	94	PR D50 4412	D.V. Bugg *et al.*	(LOQM)
KAMINSKI	94	PR D50 3145	R. Kaminski, L. Lesniak, J.P. Maillet	(CRAC+)
ZOU	94B	PR D50 591	B.S. Zou, D.V. Bugg	(LOQM)
MORGAN	93	PR D48 1185	D. Morgan, M.R. Pennington	(RAL, DURH)
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MARSISKE	90	PR D41 3324	H. Marsiske *et al.*	(Crystal Ball Collab.)
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OEST	90	ZPHY C47 343	T. Oest *et al.*	(JADE Collab.)
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AUGUSTIN	89	NP B320 1	J.E. Augustin, G. Cosme	(DM2 Collab.)
VOROBYEV	88	SJNP 48 273 Translated from YAF 48 436.	P.V. Vorobiev *et al.*	(NOVO)

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ETKIN	82B	PR D25 1786	A. Etkin *et al.*	(BNL, CUNY, TUFTS, VAND)
GIDAL	81	PL 107B 153	G. Gidal *et al.*	(SLAC, LBL)
ACHASOV	80	SJNP 32 566	N.N. Achasov, S.A. Devyanin, G.N. Shestakov	(NOVM)
		Translated from YAF 32 1098.		
LOVERRE	80	ZPHY C6 187	P.F. Loverre *et al.*	(CERN, CDEF, MADR+) IJP
AGUILAR-...	78	NP B140 73	M. Aguilar-Benitez *et al.*	(MADR, BOMB+)
CASON	78	PRL 41 271	N.M. Cason *et al.*	(NDAM, ANL)
LEEPER	77	PR D16 2054	R.J. Leeper *et al.*	(ISU)
ROSSELET	77	PR D15 574	L. Rosselet *et al.*	(GEVA, SACL)
WETZEL	76	NP B115 208	W. Wetzel *et al.*	(ETH, CERN, LOIC)
SRINIVASAN	75	PR D12 681	V. Srinivasan *et al.*	(NDAM, ANL)
GRAYER	74	NP B75 189	G. Grayer *et al.*	(CERN, MPIM)
BINNIE	73	PRL 31 1534	D.M. Binnie *et al.*	(LOIC, SHMP)
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PROTOPOP...	73	PR D7 1279	S.D. Protopopescu *et al.*	(LBL)

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CLOSE	01	PL B515 13	F.E. Close, A. Kirk	
GOKALP	01	PR D64 053017	A. Gokalp, O. Yilmaz	
SUROVTSEV	01	PR D63 054024	Y.S. Surovtsev, D. Krupa, M. Nagy	
BEVEREN	00	PL B495 300	E. van Beveren, G. Rupp, M.D. Scadron	
Also	01	PL B509 365 (erratum)	E. van Beveren, G. Rupp, M.D. Scadron	
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ABREU	99J	PL B449 364	P. Abreu *et al.*	(DELPHI Collab.)
ANISOVICH	99D	PL B452 180	A.V. Anisovich *et al.*	
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ANISOVICH	99H	PL B467 289	A.V. Anisovich, V.V. Anisovich	
BLACK	99	PR D59 074026	D. Black *et al.*	
DELBOURGO	99	PL B446 332	R. Delbourgo, D. Liu, M. Scadron	
MARCO	99	PL B470 20	E. Marco *et al.*	
MINKOWSKI	99	EPJ C9 283	P. Minkowski, W. Ochs	
ACHASOV	98G	JETPL 67 464	N.N. Achasov *et al.*	
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CHLIAPNIK...	98	PL B423 401	P.V. Chliapnikov, V.A. Uvarov	
ACHASOV	97E	IJMP A12 5019	N.N. Achasov *et al.*	
PROKOSHKIN	97	SPD 42 117	Y.D. Prokoshkin *et al.*	(SERP)
		Translated from DANS 353 323.		
AU	87	PR D35 1633	K.L. Au, D. Morgan, M.R. Pennington	(DURH, RAL)
AKESSON	86	NP B264 154	T. Akesson *et al.*	(Axial Field Spec. Collab.)
BEVEREN	86	ZPHY C30 615	E. van Beveren *et al.*	(NIJM, BIEL)
MENNESSIER	83	ZPHY C16 241	G. Mennessier	(MONP)
BARBER	82	ZPHY C12 1	D.P. Barber *et al.*	(DARE, LANC, SHEF)
ETKIN	82C	PR D25 2446	A. Etkin *et al.*	(BNL, CUNY, TUFTS, VAND)
SRINIVASAN	75	PR D12 681	V. Srinivasan *et al.*	(NDAM, ANL)
BIGI	62	CERN Conf. 247	A. Bigi *et al.*	(CERN)
BINGHAM	62	CERN Conf. 240	H.H. Bingham *et al.*	(EPOL, CERN)
ERWIN	62	PRL 9 34	A.R. Erwin *et al.*	(WISC, BNL)
WANG	61	JETP 13 323	K.-C. Wang *et al.*	(JINR)
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