Further States

OMITTED FROM SUMMARY TABLE

This section contains states observed by a single group or states poorly established that thus need confirmation. Publications that exclude earlier claims in this section are listed under 'Other Related Papers.'

QUANTUM NUMBERS, MASSES, WIDTHS, AND BRANCHING RATIOS

$X(1070)$ $I^G(J^{PC}) = ?^?(0^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		COMMENT
1072 ± 1	3.5 ± 0.5	[1] VLADIMIRSK...08		$40\ \pi^- p \rightarrow K^0_S K^0_S n + m\pi^0$

[1] Supersedes GRIGOR'EV 05.

$X(1110)$ $I^G(J^{PC}) = 0^+(\text{even}^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1107 ± 4	$111 \pm 8 \pm 15$	DAFTARI	87	DBC	$0.\ \overline{p} n \rightarrow \rho^- \pi^+ \pi^-$

$f_0(1200\text{–}1600)$ $I^G(J^{PC}) = 0^+(0^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1323 ± 8	237 ± 20	VLADIMIRSK...06		SPEC	$40\ \pi^- p \rightarrow K^0_S K^0_S n$
1480^{+100}_{-150}	1030^{+80}_{-170}	[2] ANISOVICH	03	SPEC	
1530^{+90}_{-250}	560 ± 40	[3] ANISOVICH	03	SPEC	

[2] 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.

[3] K-matrix pole from combined analysis of $\pi^- p \rightarrow \pi^0 \pi^0 n$, $\pi^- p \rightarrow K \overline{K} n$, $\overline{p} p \rightarrow \pi^0 \pi^0 \pi^0$, $\pi^0 \eta \eta$, $\pi^0 \pi^0 \eta$ at rest.

$X(1420)$ $I^G(J^{PC}) = 2^+(0^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1420 ± 20	160 ± 10	FILIPPI	00	OBLX	$0\ \overline{n} p \rightarrow \pi^+ \pi^+ \pi^-$

$X(1545)$ $I^G(J^{PC}) = ?^?(?^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		COMMENT
1545 ± 3	6.0 ± 2.5	[4] VLADIMIRSK...08		$40\ \pi^- p \rightarrow K^0_S K^0_S n + m\pi^0$

[4] Supersedes VLADIMIRSKII 00.

$X(1575)$ $I^G(J^{PC}) = ?^?(1^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1576^{+49+98}_{-55-91}	$818^{+22+64}_{-23-133}$	[5] ABLIKIM	06S	BES	$J/\psi \to K^+K^-\pi^0$

[5] A broad peak observed at K^+K^- invariant mass. Mass and width above are its pole position. The observed branching ratio is $B(J/\psi \to X\pi^0)\ B(X \to K^+K^-) = (8.5 \pm 0.6^{+2.7}_{-3.6}) \times 10^{-4}$.

$X(1600)$ $I^G(J^{PC}) = 2^+(2^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1600 ± 100	400 ± 200	[6] ALBRECHT	91F	ARG	$10.2\ e^+e^- \to e^+e^-2(\pi^+\pi^-)$

[6] Our estimate.

$X(1650)$ $I^G(J^{PC}) = 0^-(?^?-)$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
1652 ± 7	<50	100	PROKOSHKIN 96	GAM2	$32,38\ \pi p \to \omega\eta n$

$X(1730)$ $I^G(J^{PC}) = ?^?(?^?+)$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
$1731.0 \pm 1.2 \pm 2.0$	$3.2 \pm 0.8 \pm 1.3$	58	VLADIMIRSK...07	SPEC	$40\ \pi^- p \to K^0_S K^0_S X$

$X(1750)$ $I^G(J^{PC}) = ?^?(1^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
$1753.5 \pm 1.5 \pm 2.3$	$122.2 \pm 6.2 \pm 8.0$	LINK	02K	FOCS	$20\text{–}160\ \gamma p \to K^+K^-p$

$B(X(1750) \to \overline{K}^*(892)^0 K^0 \to K^\pm\pi^\mp K^0_S)/B(X(1750) \to K^+K^-)$

VALUE	*CL%*	*DOCUMENT ID*		*TECN*
<0.065	90	LINK	02K	FOCS

$B(X(1750) \to \overline{K}^*(892)^\pm K^\mp \to K^\pm\pi^\mp K^0_S)/B(X(1750) \to K^+K^-)$

VALUE	*CL%*	*DOCUMENT ID*		*TECN*
<0.183	90	LINK	02K	FOCS

$f_2(1750)$ $I^G(J^{PC}) = 0^+(2^{++})$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1755 ± 10	67 ± 12	870	[7] SCHEGELSKY	06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

$\Gamma(K\overline{K})$

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
17 ± 5	870	[8] SCHEGELSKY	06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

Γ(γγ)

VALUE (keV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.13±0.04	870	[8] SCHEGELSKY	06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

Γ(ππ)

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.3±1.0	870	[8] SCHEGELSKY	06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

Γ(ηη)

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.0±0.5	870	[8] SCHEGELSKY	06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

[7] From analysis of L3 data at 91 and 183–209 GeV.
[8] From analysis of L3 data at 91 and 183–209 GeV and using SU(3) relations.

X(1775) $I^G(J^{PC}) = 1^-(?^{-+})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1763±20	192 ± 60	CONDO	91	SHF	$\gamma p \to (p\pi^+)(\pi^+\pi^-\pi^-)$
1787±18	118 ± 60	CONDO	91	SHF	$\gamma p \to n\pi^+\pi^+\pi^-$

X(1855) $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1856.6±5	20 ± 5	BRIDGES	86D	SPEC	0. $\overline{p}d \to \pi\pi N$

X(1870) $I^G(J^{PC}) = ?^?(2^{??})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1870±40	250 ± 30	ALDE	86D	GAM4	100 $\pi^- p \to 2\eta X$

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a_3(1875) $I^G(J^{PC}) = 1^-(3^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1874±43±96	385 ± 121 ± 114	CHUNG	02	B852	18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$

B(a_3(1875) → f_2(1270)π)/B(a_3(1875) → ρπ)

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.8±0.2	[9] CHUNG	02	B852	18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$

[9] Using the observable fractions of 50.0% $\rho\pi$, 56.5% $f_2\pi$, and 11.8% $\rho_3\pi$.

B(a_3(1875) → ρ_3(1690)π)/B(a_3(1875) → ρπ)

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.9±0.3	[10] CHUNG	02	B852	18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$

[10] Using the observable fractions of 50.0% $\rho\pi$, 56.5% $f_2\pi$, and 11.8% $\rho_3\pi$.

$a_1(1930)$ $I^G(J^{PC}) = 1^-(1^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1930^{+30}_{-70}	155 ± 45	ANISOVICH	01F	SPEC	2.0 $\overline{p}p \to 3\pi^0$, $\pi^0\eta$, $\pi^0\eta'$

$X(1935)$ $I^G(J^{PC}) = 1^+(1^{-?})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1935±20	215 ± 30	EVANGELIS...	79	OMEG	10,16 $\pi^- p \to \overline{p}pn$

$\rho_2(1940)$ $I^G(J^{PC}) = 1^+(2^{--})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1940±40	155 ± 40	[11] ANISOVICH	02	SPEC	0.6–1.9 $p\overline{p} \to \omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$

[11] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

$\omega_3(1945)$ $I^G(J^{PC}) = 0^-(3^{--})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1945±20	115 ± 22	[12] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \to \omega\eta$, $\omega\pi^0\pi^0$

[12] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$\omega(1960)$ $I^G(J^{PC}) = 0^-(1^{--})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1960±25	195 ± 60	[13] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \to \omega\eta$, $\omega\pi^0\pi^0$

[13] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$b_1(1960)$ $I^G(J^{PC}) = 1^+(1^{+-})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1960±35	230 ± 50	[14] ANISOVICH	02	SPEC	0.6–1.9 $p\overline{p} \to \omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$

[14] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

$h_1(1965)$ $I^G(J^{PC}) = 0^-(1^{+-})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
1965±45	345 ± 75	[15] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \to \omega\eta$, $\omega\pi^0\pi^0$

[15] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$f_1(1970)$ $I^G(J^{PC}) = 0^+(1^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
1971 ± 15	240 ± 45	ANISOVICH	00J	SPEC

$X(1970)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1970 ± 10	40 ± 20	CHLIAPNIK...	80	HBC	32 $K^+ p \rightarrow 2K^0_S 2\pi X$

$X(1975)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1973 ± 15	80	30	CASO	70	HBC	11.2 $\pi^- p \rightarrow \rho 2\pi$

$\omega_2(1975)$ $I^G(J^{PC}) = 0^-(2^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
1975 ± 20	175 ± 25	[16] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \rightarrow \omega\eta, \omega\pi^0\pi^0$

[16] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$a_2(1990)$ $I^G(J^{PC}) = 1^-(2^{++})$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$2050 \pm 10 \pm 40$	$190 \pm 22 \pm 100$	18k	[17] SCHEGELSKY	06	RVUE	$\gamma\gamma \rightarrow \pi^+\pi^-\pi^0$
$2003 \pm 10 \pm 19$	$249 \pm 23 \pm 32$		LU	05	B852	18 $\pi^- p \rightarrow \omega\pi^-\pi^0 p$
1990^{+15}_{-30}	190 ± 50		ANISOVICH	99C	SPEC	

[17] From analysis of L3 data at 183–209 GeV.

$\Gamma(\gamma\gamma)\ \Gamma(\pi^+\pi^-\pi^0)$ / Γ(total)

VALUE (keV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$0.11 \pm 0.04 \pm 0.05$	18k	[18] SCHEGELSKY	06	RVUE	$\gamma\gamma \rightarrow \pi^+\pi^-\pi^0$

[18] From analysis of L3 data at 183–209 GeV.

$\rho(2000)$ $I^G(J^{PC}) = 1^+(1^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2000 ± 30	260 ± 45	[19] BUGG	04C	RVUE

[19] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

$f_2(2000)$ $I^G(J^{PC}) = 0^+(2^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2001 ± 10	312 ± 32	ANISOVICH	00J	SPEC

$X(2000)$ $I^G(J^{PC}) = 1^-(?^{?+})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
1964 ± 35	225 ± 50	[20] ARMSTRONG	93D	E760		$\overline{p}p \rightarrow 3\pi^0 \rightarrow 6\gamma$
~ 2100	~ 500	[20] ANTIPOV	77	CIBS	$-$	$25\ \pi^- p \rightarrow p\pi^- \rho_3$
2214 ± 15	355 ± 21	[21] BALTAY	77	HBC	0	$15\ \pi^- p \rightarrow \Delta^{++} 3\pi$
2080 ± 40	340 ± 80	KALELKAR	75	HBC	$+$	$15\ \pi^+ p \rightarrow p\pi^+ \rho_3$

[20] Cannot determine spin to be 3.
[21] BALTAY 77 favors $J^P = ,3^+$.

$X(2000)$ $I^G(J^{PC}) = ?^?(4^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*	*TECN*	*COMMENT*
$1998 \pm 3 \pm 5$	<15	VLADIMIRSK...03	SPEC	$\pi^- p \rightarrow K^0_S K^0_S M M$

$\pi_2(2005)$ $I^G(J^{PC}) = 1^-(2^{-+})$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$1974 \pm 14 \pm 83$	$341 \pm 61 \pm 139$	145k	LU	05	B852	$18\ \pi^- p \rightarrow \omega\pi^-\pi^0 p$
2005 ± 15	200 ± 40		ANISOVICH	01F	SPEC	$2.0\ \overline{p}p \rightarrow 3\pi^0,\ \pi^0\eta,$ $\pi^0\eta'$

$\eta(2010)$ $I^G(J^{PC}) = 0^+(0^{-+})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2010^{+35}_{-60}	270 ± 60	ANISOVICH	00J	SPEC

$\pi_1(2015)$ $I^G(J^{PC}) = 1^-(1^{-+})$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$2014 \pm 20 \pm 16$	$230 \pm 32 \pm 73$	145k	LU	05	B852	$18\ \pi^- p \rightarrow \omega\pi^-\pi^0 p$
$2001 \pm 30 \pm 92$	$333 \pm 52 \pm 49$	69k	KUHN	04	B852	$18\ \pi^- p \rightarrow \eta\pi^+\pi^-\pi^- p$

$a_0(2020)$ $I^G(J^{PC}) = 1^-(0^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2025 ± 30	330 ± 75	ANISOVICH	99C	SPEC

$X(2020)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2015 ± 3	10 ± 4	FERRER	99	RVUE	$\pi p \rightarrow p p \overline{p} \pi(\pi)$

$h_3(2025)$ $I^G(J^{PC}) = 0^-(3^{+-})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2025 ± 20	145 ± 30	[22] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \rightarrow \omega\eta, \omega\pi^0\pi^0$

[22] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$b_3(2025)$ $I^G(J^{PC}) = 1^+(3^{+-})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2032 ± 12	117 ± 11	[23] ANISOVICH	02	SPEC	0.6–1.9 $p\overline{p} \rightarrow \omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$

[23] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

$\eta_2(2030)$ $I^G(J^{PC}) = 0^+(2^{-+})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
$2030 \pm 5 \pm 15$	$205 \pm 10 \pm 15$	ANISOVICH	00E	SPEC

$B(a_2\pi)_{L=0}/B(a_2\pi)_{L=2}$

VALUE	*DOCUMENT ID*		*TECN*
0.74 ± 0.17	[24] ANISOVICH	00E	SPEC

$B(a_0\pi)/B(a_2\pi)_{L=2}$

VALUE	*DOCUMENT ID*		*TECN*
0.072 ± 0.016	[24] ANISOVICH	00E	SPEC

$B(f_2\eta)/B(a_2\pi)_{L=2}$

VALUE	*DOCUMENT ID*		*TECN*
0.074 ± 0.026	[24] ANISOVICH	00E	SPEC

[24] Corrected for all decay modes.

$f_3(2050)$ $I^G(J^{PC}) = 0^+(3^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2048 ± 8	213 ± 34	ANISOVICH	00J	SPEC	2.0 $p\overline{p} \rightarrow \eta\pi^0\pi^0$

$f_0(2060)$ $I^G(J^{PC}) = 0^+(0^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
~ 2050	~ 120	[25] OAKDEN	94	RVUE	0.36–1.55 $\overline{p}p \rightarrow \pi\pi$
~ 2060	~ 50	[25] OAKDEN	94	RVUE	0.36–1.55 $\overline{p}p \rightarrow \pi\pi$

[25] See SEMENOV 99 and KLOET 96.

$\pi(2070)$ $I^G(J^{PC}) = 1^-(0^{-+})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2070 ± 35	310^{+100}_{-50}	ANISOVICH	01F	SPEC	2.0 $\overline{p}p \rightarrow 3\pi^0,\ \pi^0\eta,\ \pi^0\eta'$

$a_3(2070)$ $I^G(J^{PC}) = 1^-(3^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN
2070 ± 20	170 ± 40	ANISOVICH	99C	SPEC

$X(2075)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
$2075 \pm 12 \pm 5$	$90 \pm 35 \pm 9$	[26] ABLIKIM	04J	BES2	$J/\psi \rightarrow K^- p\overline{\Lambda}$

[26] From a fit in the region $M_{p\overline{\Lambda}} - M_p - M_\Lambda < 150$ MeV. S-wave in the $p\overline{\Lambda}$ system preferred.

$a_2(2080)$ $I^G(J^{PC}) = 1^-(2^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN
2060 ± 20	195 ± 30	ANISOVICH	99C	SPEC
2100^{+10}_{-30}	360^{+40}_{-100}	ANISOVICH	99E	SPEC

$X(2080)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2080 ± 10	110 ± 20	KREYMER	80	STRC	13 $\pi^- d \rightarrow p\overline{p}n(n_s)$

$X(2080)$ $I^G(J^{PC}) = ?^?(3^{-?})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2080 ± 10	190 ± 15	ROZANSKA	80	SPRK	18 $\pi^- p \rightarrow p\overline{p}n$

$a_1(2095)$ $I^G(J^{PC}) = 1^-(1^{++})$

MASS (MeV)	WIDTH (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
$2096 \pm 17 \pm 121$	$451 \pm 41 \pm 81$	69k	KUHN	04	B852	18 $\pi^- p \rightarrow \eta\pi^+\pi^-\pi^- p$

B($a_1(2095) \rightarrow f_1(1285)\pi$) / B($a_1(2095) \rightarrow a_1(1260)$)

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
3.18 ± 0.64	69k	KUHN	04	B852	18 $\pi^- p \rightarrow \eta\pi^+\pi^-\pi^- p$

$\eta(2100)$ $I^G(J^{PC}) = 0^+(0^{-+})$

MASS (MeV)	WIDTH (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
2103 ± 50	187 ± 75	586	[27] BISELLO	89B	DM2	$J/\psi \rightarrow 4\pi\gamma$

[27] ASTON 81B sees no peak, has 850 events in Ajinenko+Barth bins. ARESTOV 80 sees no peak.

$X(2100)$ $I^G(J^{PC}) = ?^?(0^{??})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2100 ± 40	250 ± 40	ALDE	86D	GAM4	$100\ \pi^- p \rightarrow\ 2\eta X$

$X(2110)$ $I^G(J^{PC}) = 1^+(3^{-?})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2110 ± 10	330 ± 20	EVANGELIS...	79	OMEG	$10{,}16\ \pi^- p \rightarrow\ \overline{p} p n$

$f_2(2140)$ $I^G(J^{PC}) = 0^+(2^{++})$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2141 ± 12	49 ± 28	389	GREEN	86	MPSF	$400\ pA \rightarrow\ 4KX$

$X(2150)$ $I^G(J^{PC}) = ?^?(2^{+?})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2150 ± 10	260 ± 10	ROZANSKA	80	SPRK	$18\ \pi^- p \rightarrow\ p\overline{p} n$

$a_2(2175)$ $I^G(J^{PC}) = 1^-(2^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2175 ± 40	310^{+90}_{-45}	ANISOVICH	01F	SPEC	$2.0\ \overline{p} p \rightarrow\ 3\pi^0,\ \pi^0\eta,\ \pi^0\eta'$

$\eta(2190)$ $I^G(J^{PC}) = 0^+(0^{-+})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2190 ± 50	850 ± 100	BUGG	99	BES

$\omega_2(2195)$ $I^G(J^{PC}) = 0^-(2^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2195 ± 30	225 ± 40	[28] ANISOVICH	02B	SPEC	$0.6\text{–}1.9\ p\overline{p} \rightarrow\ \omega\eta,\ \omega\pi^0\pi^0$

[28] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$\omega(2205)$ $I^G(J^{PC}) = 0^-(1^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2205 ± 30	350 ± 90	[29] ANISOVICH	02B	SPEC	$0.6\text{–}1.9\ p\overline{p} \rightarrow\ \omega\eta,\ \omega\pi^0\pi^0$

[29] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$X(2210)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2210^{+79}_{-21}	203^{+437}_{-87}	EVANGELIS...	79B	OMEG	10 $\pi^- p \rightarrow K^+ K^- n$

$X(2210)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2207 ± 22	130	CASO	70	HBC	11.2 $\pi^- p$

$h_1(2215)$ $I^G(J^{PC}) = 0^-(1^{+-})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2215 ± 40	325 ± 55	[30] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \rightarrow \omega\eta$, $\omega\pi^0\pi^0$

[30] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$b_1(2240)$ $I^G(J^{PC}) = 1^+(1^{+-})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2240 ± 35	320 ± 85	[31] ANISOVICH	02	SPEC	0.6–1.9 $p\overline{p} \rightarrow \omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$

[31] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

$\rho_2(2240)$ $I^G(J^{PC}) = 1^+(2^{--})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2225 ± 35	335^{+100}_{-50}	[32] ANISOVICH	02	SPEC	0.6–1.9 $p\overline{p} \rightarrow \omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$

[32] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

$\rho_4(2240)$ $I^G(J^{PC}) = 1^+(4^{--})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2230 ± 25	210 ± 30	[33] ANISOVICH	02	SPEC	0.6–1.9 $p\overline{p} \rightarrow \omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$

[33] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

$\pi_2(2245)$ $I^G(J^{PC}) = 1^-(2^{-+})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2245 ± 60	320^{+100}_{-40}	ANISOVICH	01F	SPEC	2.0 $\overline{p}p \rightarrow 3\pi^0$, $\pi^0\eta$, $\pi^0\eta'$

$b_3(2245)$ $I^G(J^{PC}) = 1^+(3^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2245±50	320 ± 70	[34] BUGG	04C	RVUE

[34] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

$\eta_2(2250)$ $I^G(J^{PC}) = 0^+(2^{-+})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2248±20	280 ± 20	ANISOVICH	00I	SPEC
2267±14	290 ± 50	ANISOVICH	00J	SPEC

$\pi_4(2250)$ $I^G(J^{PC}) = 1^-(4^{-+})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2250±15	215 ± 25	ANISOVICH	01F	SPEC	2.0 $\overline{p}p \rightarrow$ $3\pi^0$, $\pi^0\eta$, $\pi^0\eta'$

$\omega_4(2250)$ $I^G(J^{PC}) = 0^-(4^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2250±30	150 ± 50	[35] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \rightarrow$ $\omega\eta$, $\omega\pi^0\pi^0$

[35] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$\omega_5(2250)$ $I^G(J^{PC}) = 0^-(5^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2250±70	320 ± 95	[36] BUGG	04	RVUE

[36] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$\omega_3(2255)$ $I^G(J^{PC}) = 0^-(3^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2255±15	175 ± 30	[37] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \rightarrow$ $\omega\eta$, $\omega\pi^0\pi^0$

[37] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$X(2260)$ $I^G(J^{PC}) = 0^+(4^{+?})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2260±20	400 ± 100	EVANGELIS...	79	OMEG	10,16 $\pi^- p \rightarrow$ $\overline{p}pn$

$\rho(2270)$ $I^G(J^{PC}) = 1^+(1^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2265±40	325 ± 80	[38] ANISOVICH	02	SPEC	0.6–1.9 $p\overline{p} \rightarrow$ $\omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$
2280±50	440 ± 110	ATKINSON	85	OMEG	20–70 $\gamma p \rightarrow$ $p\omega\pi^+\pi^-\pi^0$

[38] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

$a_1(2270)$ $I^G(J^{PC}) = 1^-(1^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2270^{+55}_{-40}	305^{+70}_{-40}	ANISOVICH	01F	SPEC	2.0 $\overline{p}p \rightarrow 3\pi^0$, $\pi^0\eta$, $\pi^0\eta'$

$a_2(2270)$ $I^G(J^{PC}) = 1^-(2^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN
2265 ± 20	235^{+60}_{-35}	ANISOVICH	99C	SPEC
2280 ± 30	280 ± 50	ANISOVICH	99E	SPEC

$h_3(2275)$ $I^G(J^{PC}) = 0^-(3^{+-})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2275 ± 25	190 ± 45	[39] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \rightarrow \omega\eta$, $\omega\pi^0\pi^0$

[39] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$a_4(2280)$ $I^G(J^{PC}) = 1^-(4^{++})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2300 ± 20	230 ± 40	ANISOVICH	99C	SPEC	
2260 ± 15	180 ± 20	ANISOVICH	99E	SPEC	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2237 ± 5	291 ± 12	[40] UMAN	06	E835	5.2 $\overline{p}p \rightarrow \eta\eta\pi^0$

[40] Statistical error only.

$\eta(2280)$ $I^G(J^{PC}) = 0^+(0^{-+})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN
2320 ± 15	230 ± 35	[41] ANISOVICH	00M	SPEC

[41] From the combined analysis of $\overline{p}p \rightarrow \eta\eta\eta$ from ANISOVICH 00M and $\overline{p}p \rightarrow \eta\pi^0\pi^0$ from ANISOVICH 00J.

$\omega_3(2285)$ $I^G(J^{PC}) = 0^-(3^{--})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2278 ± 28	224 ± 50	[42] BUGG	04A	RVUE	
2285 ± 60	230 ± 40	[43] ANISOVICH	02B	SPEC	0.6–1.9 $p\overline{p} \rightarrow \omega\eta$, $\omega\pi^0\pi^0$

[42] Partial wave analysis of the data on $p\overline{p} \rightarrow \overline{\Lambda}\Lambda$ from BARNES 00.
[43] From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.

$\omega(2290)$ $I^G(J^{PC}) = 0^-(1^{--})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN
2290 ± 20	275 ± 35	[44] BUGG	04A	RVUE

[44] Partial wave analysis of the data on $p\overline{p} \to \overline{\Lambda}\Lambda$ from BARNES 00.

$f_3(2300)$ $I^G(J^{PC}) = 0^+(3^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2334 ± 25	200 ± 20	[45] BUGG	04A	RVUE	
2303 ± 15	214 ± 29	ANISOVICH	00J	SPEC	2.0 $p\overline{p} \to \eta\pi^0\pi^0$

[45] Partial wave analysis of the data on $p\overline{p} \to \overline{\Lambda}\Lambda$ from BARNES 00.

$\rho_3(2300)$ $I^G(J^{PC}) = 1^+(3^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2300^{+50}_{-80}	340 ± 50	ANISOVICH	00J	SPEC

$a_3(2310)$ $I^G(J^{PC}) = 1^-(3^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2310 ± 40	180^{+120}_{-60}	ANISOVICH	99C	SPEC

$f_1(2310)$ $I^G(J^{PC}) = 0^+(1^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2310 ± 60	255 ± 70	ANISOVICH	00J	SPEC

$\eta_4(2330)$ $I^G(J^{PC}) = 0^+(4^{-+})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2328 ± 38	240 ± 90	ANISOVICH	00J	SPEC	2.0 $p\overline{p} \to \eta\pi^0\pi^0$

$\omega(2330)$ $I^G(J^{PC}) = 0^-(1^{--})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2330 ± 30	435 ± 75	ATKINSON	88	OMEG	25–50 $\gamma p \to \rho^{\pm}\rho^0\pi^{\mp}$

$a_1(2340)$ $I^G(J^{PC}) = 1^-(1^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*
2340 ± 40	230 ± 70	ANISOVICH	99E	SPEC

$X(2340)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2340 ± 20	180 ± 60	126	[46] BALTAY	75	HBC	15 $\pi^+ p \to p5\pi$

[46] Dominant decay into $\rho^0\rho^0\pi^+$. BALTAY 78 finds confirmation in $2\pi^+\pi^-2\pi^0$ events which contain $\rho^+\rho^0\pi^0$ and $2\rho^+\pi^-$.

$\pi(2360)$ $I^G(J^{PC}) = 1^-(0^{-+})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2360 ± 25	300^{+100}_{-50}	ANISOVICH	01F	SPEC	2.0 $\overline{p}p \rightarrow 3\pi^0,\ \pi^0\eta,\ \pi^0\eta'$

$X(2360)$ $I^G(J^{PC}) = ?^?(4^{+?})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2360 ± 10	430 ± 30	ROZANSKA	80	SPRK	18 $\pi^- p \rightarrow p\overline{p}n$

$X(2440)$ $I^G(J^{PC}) = ?^?(5^{-?})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2440 ± 10	310 ± 20	ROZANSKA	80	SPRK	18 $\pi^- p \rightarrow p\overline{p}n$

$X(2632)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2635.2 ± 3.3		[47] EVDOKIMOV	04	SELX	$X(2632) \rightarrow D_s^+\eta$
2631.6 ± 2.1	< 17	[48] EVDOKIMOV	04	SELX	$X(2632) \rightarrow D^0K^+$

[47] From a mass difference to D_s^+ of 666.9 ± 3.3 MeV.

[48] From a mass difference to D^0 of 767.0 ± 2.0 MeV.

B($X(2632) \rightarrow D^0K^+$)/B($X(2632) \rightarrow D_s^+\eta$)

VALUE	DOCUMENT ID		TECN
0.14 ± 0.06	[49] EVDOKIMOV	04	SELX

[49] Possible interpretation of this decay pattern is discussed by YASUI 07.

$X(2680)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2676 ± 27	150	CASO	70	HBC	11.2 $\pi^- p \rightarrow \rho^-\pi^+\pi^- p$

$X(2710)$ $I^G(J^{PC}) = ?^?(6^{+?})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2710 ± 20	170 ± 40	ROZANSKA	80	SPRK	18 $\pi^- p \rightarrow p\overline{p}n$

$X(2750)$ $I^G(J^{PC}) = ?^?(7^{-?})$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
2747 ± 32	195 ± 75	DENNEY	83	LASS	10 $\pi^+ p \rightarrow K^+K^-\pi^+ p$

$X(2860)$ $I(J^P) = 0(?^?)$

MASS (MeV)	WIDTH (MeV)	DOCUMENT ID		TECN	COMMENT
$2856.6\pm1.5\pm5.0$	$47\pm7\pm10$	[50,51] AUBERT,BE	06E	BABR	$e^+e^- \rightarrow DKX$

[50] Conventional $c\bar{s}$ nature suggested by LI 07 and ZHANG 07.
[51] Observed in the D^0K^+ and D^+K^0 final states. J^P is natural.

$f_6(3100)$ $I^G(J^{PC}) = 0^+(6^{++})$

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
3100 ± 100	700 ± 130	BINON	05	GAMS	$33\ \pi^- p \rightarrow \eta\eta n$

$X(3250)$ $I^G(J^{PC}) = ?^?(?^{??})$ 3-Body Decays

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
$3250 \pm 8 \pm 20$	45 ± 18	ALEEV	93	BIS2	$X(3250) \rightarrow \Lambda\overline{p}K^+$
$3265 \pm 7 \pm 20$	40 ± 18	ALEEV	93	BIS2	$X(3250) \rightarrow \overline{\Lambda}pK^-$

$X(3250)$ $I^G(J^{PC}) = ?^?(?^{??})$ 4-Body Decays

MASS (MeV)	*WIDTH* (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
$3245 \pm 8 \pm 20$	25 ± 11	ALEEV	93	BIS2	$X(3250) \rightarrow \Lambda\overline{p}K^+\pi^\pm$
$3250 \pm 9 \pm 20$	50 ± 20	ALEEV	93	BIS2	$X(3250) \rightarrow \overline{\Lambda}pK^-\pi^\mp$
$3270 \pm 8 \pm 20$	25 ± 11	ALEEV	93	BIS2	$X(3250) \rightarrow K^0_S p\overline{p}K^\pm$

$X(3350)$ $I^G(J^{PC}) = ?^?(?^{??})$

MASS (MeV)	*WIDTH* (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$3350^{+10}_{-20} \pm 20$	$70^{+40}_{-30} \pm 40$	50 ± 10	GABYSHEV	06A	BELL	$B^- \rightarrow \Lambda_c^+ \overline{p}\pi^-$

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ANISOVICH	04	SPU 47 45	V.V. Anisovich	
		Translated from UFN 174 49.		
BARNES	04A	PL B600 223	T. Barnes *et al.*	
BUGG	04B	PL B598 8	D.V. Bugg	
BUGG	04C	PRPL 397 257	D.V. Bugg	
CHAO	04A	PL B599 43	K.-T. Chao	
CHEN	04C	PRL 93 232001	Y.-Q. Chen, X.-Q. Li	
DAI	04	JHEP 0411 043	Y.-B. Dai *et al.*	
GAO	04	CTP 42 844	G.-S. Gao, S.-L. Zhu	
KERBIKOV	04	PR C69 055205	B. Kerbikov *et al.*	
LIU	04A	PR D70 094009	Y.-R. Liu	
MAIANI	04	PR D70 054009	L. Maiani *et al.*	
SIMONOV	04	PR D70 114013	Yu.A. Simonov, J.A. Tjon	
SWANSON	04	PL B582 167	E. Swanson	
VANBEVEREN	04A	PRL 93 202001	E. van Beveren, G. Rupp	
ZOU	04	PR D69 034004	B.S. Zou, H.C. Chiang	
DATTA	03B	PL B567 273	A. Datta, P.J. O'Donnell	
ROSNER	03B	PR D68 014004	J.L. Rosner	
WANG	03	PRL 90 201802	M.-Z. Wang *et al.*	(BELLE Collab.)
ABE	02K	PRL 88 181803	K. Abe *et al.*	(BELLE Collab.)
ABE	02W	PRL 89 151802	K. Abe *et al.*	(BELLE Collab.)
ANISOVICH	01E	PL B513 281	A.V. Anisovich *et al.*	
ABELE	00B	EPJ C17 583	A. Abele *et al.*	
BARNES	00	PR C62 055203	P.D. Barnes *et al.*	
BOLONKIN	00	JETPL 72 166	B.V. Bolonkin *et al.*	
		Translated from ZETFP 72 240.		
ANISOVICH	99F	NP A651 253	A.V. Anisovich *et al.*	
CHIBA	99	PR C60 035204	M. Chiba *et al.*	
BUZZO	97	ZPHY C76 475	A. Buzzo *et al.*	(JETSET Collab.)
CHIBA	97	PR D55 40	M. Chiba *et al.*	(FUKI, INUS, KEK, SANG+)
BARNES	94	PL B331 203	P.D. Barnes *et al.*	(PS185 Collab.)
CARBONELL	93	PL B306 407	J. Carbonell, K.V. Protasov, O.D. Dalkarov	(ISNG+)
FERRER	93	NP A558 191c	A. Ferrer, A.A. Grigorian	(WA56 Collab.)
CHIBA	91	PR D44 1933	M. Chiba *et al.*	(FUKI, KEK, SANG, OSAK+)
GRAF	91	PR D44 1945	N.A. Graf *et al.*	(UCI, PENN, NMSU, KARLK+)
TANIMORI	90	PR D41 744	T. Tanimori *et al.*	(KEK, INUS, KYOT+)
ALBRECHT	89M	PL B217 205	H. Albrecht *et al.*	(ARGUS Collab.)
BEHREND	89D	PL B218 493	H.J. Behrend *et al.*	(CELLO Collab.)
BUSENITZ	89	PR D40 1	J.K. Busenitz *et al.*	(ILL, FNAL)
CHIBA	88	PL B202 447	M. Chiba, K. Doi	(FUKI, INUS, KEK, SANG, OSAK+)
CHIBA	87	PR D36 3321	M. Chiba *et al.*	(FUKI, INUS, KEK, SANG+)
FRANKLIN	87	PL B184 111	J. Franklin	
LIU	87	PRL 58 2288	K.F. Liu, B.A. Li	(STON)
ADIELS	86	PL B182 405	L. Adiels *et al.*	(STOH, BASL, LASL, THES+)
ANGELOPO...	86	PL B178 441	A. Angelopoulos *et al.*	(ATHU, UCI, KARLK+)
ARMSTRONG	86C	PL B175 383	T.A. Armstrong *et al.*	(BNL, HOUS, PENN+)
BRIDGES	86	PRL 56 211	D.L. Bridges *et al.*	(BLSU, BNL, CASE+)
BRIDGES	86B	PRL 56 215	D.L. Bridges *et al.*	(SYRA, CASE)
BRIDGES	86C	PRL 57 1534	D.L. Bridges *et al.*	(SYRA)
BRIDGES	86D	PL B180 313	D.L. Bridges *et al.*	(SYRA, BNL, CASE+)
DOVER	86	PRL 57 1207	C.B. Dover *et al.*	(BNL)
ANGELOPO...	85	PL 159B 210	A. Angelopoulos *et al.*	(ATHU, UCI, UNM+)
BODENKAMP	85	NP B255 717	J. Bodenkamp *et al.*	(KARLK, KARLE, DESY)
ADIELS	84	PL 138B 235	L. Adiels *et al.*	(BASL, KARLK, KARLE, STOH+)
ATKINSON	84F	NP B239 1	M. Atkinson *et al.*	(BONN, CERN, GLAS+)
AZOOZ	84	NP B244 277	F. Azooz, I. Butterworth	(LOIC, RHEL, SACL+)
CLOUGH	84	PL 146B 299	A.S. Clough *et al.*	(SURR, LOQM, ANIK+)
AZOOZ	83	PL 122B 471	F. Azooz, I. Butterworth	(LOIC, RHEL, SACL+)
BARNETT	83	PR D27 493	B. Barnett *et al.*	(JHU)
BODENKAMP	83	PL 133B 275	J. Bodenkamp *et al.*	(KARLK, KARLE, DESY)
RICHTER	83	PL 126B 284	B. Richter, L. Adiels	(BASL, KARLK, KARLE, STOH+)
AJALTOUNI	82	NP B209 301	Z. Ajaltouni *et al.*	(CERN, NEUC+)
ASTON	81B	NP B189 205	D. Aston *et al.*	(BONN, CERN, EPOL, GLAS+)
BANKS	81	PL 100B 191	A.D. Banks *et al.*	(LIVP, CERN)
CHUNG	81	PRL 46 395	S.U. Chung *et al.*	(BNL, BRAN, CINC+)
HARRIS	81	ZPHY C9 275	R.M. Harris *et al.*	(SEAT, UCB)
ARESTOV	80	IHEP 80-165	Y.I. Arestov *et al.*	(SERP)
ASTON	80D	PL 93B 517	D. Aston	(BONN, CERN, EPOL, GLAS, LANC+)

BIONTA	80	PRL 44 909	R.M. Bionta *et al.*	(BNL, CMU, FNAL+)
CARROLL	80	PRL 44 1572	A.S. Carroll *et al.*	(BNL, PRIN)
DAUM	80E	PL 90B 475	C. Daum *et al.*	(AMST, CERN, CRAC, MPIM+)
DEFOIX	80	NP B162 12	C. Defoix *et al.*	(CDEF, PISA)
HAMILTON	80	PRL 44 1179	R.P. Hamilton *et al.*	(LBL, BNL, MTHO)
HAMILTON	80B	PRL 44 1182	R.P. Hamilton *et al.*	(LBL, BNL, MTHO)
KREYMER	80	PR D22 36	A.E. Kreymer *et al.*	(IND, PURD, SLAC+)
ALBERI	79	PL 83B 247	G. Alberi *et al.*	(TRST, CERN, IFRJ)
ARMSTRONG	79	PL B85 304	T.A. Armstrong *et al.*	(DESY, GLAS)
BARTALUCCI	79	NC 49A 207	S. Bartalucci *et al.*	(DESY, FRAS)
DELCOURT	79	PL 86B 395	B. Delcourt *et al.*	(LALO)
GIBBARD	79	PRL 42 1593	B.G. Gibbard *et al.*	(CORN)
SAKAMOTO	79	NP B158 410	S. Sakamoto *et al.*	(INUS)
CARTER	78B	NP B141 467	A.A. Carter	(LOQM)
ESPOSITO	78	LNC 22 305	B. Esposito, F. Felicetti	(FRAS, NAPL, PADO+)
PAVLOPO...	78	PL 72B 415	P. Pavlopoulos *et al.*	(KARLK, KARLE, BASL+)
PETERSON	78	PR D18 3955	D. Peterson *et al.*	(CORN, HARV)
BENKHEIRI	77	PL 68B 483	P. Benkheiri *et al.*	(CERN, CDEF, EPOL+)
BRUCKNER	77	PL 67B 222	W. Bruckner *et al.*	(MPIH, HEIDP, CERN)
ABASHIAN	76	PR D13 5	A. Abashian *et al.*	(ILL, ANL, CHIC+)
BRAUN	76	PL 60B 481	H.M. Braun *et al.*	(STRB)
CHALOUPKA	76	PL 61B 487	V. Chaloupka *et al.*	(CERN, LIVP, MONS+)
ALSTON-...	75	PRL 35 1685	M. Alston-Garnjost *et al.*	(LBL, MTHO)
D'ANDLAU	75	PL 58B 223	C. d'Andlau *et al.*	(CDEF, PISA)
KALOGERO...	75	PRL 34 1047	T. Kalogeropoulos, G.S. Tzanakos	(SYRA)
CARROLL	74	PRL 32 247	A.S. Carroll *et al.*	(BNL)
THOMPSON	74	NP B69 220	G. Thompson *et al.*	(PURD)
DONALD	73	NP B61 333	R.A. Donald *et al.*	(LIVP, PARIS)
ALEXANDER	72	NP B45 29	G. Alexander *et al.*	(TELA)
ANTIPOV	72	PL 40B 147	Y.M. Antipov *et al.*	(SERP)
TAKAHASHI	72	PR D6 1266	K. Takahashi *et al.*	(TOHOK, PENN, NDAM+)
BENVENUTI	71	PRL 27 283	A.C. Benvenuti *et al.*	(WISC)
SABAU	71	LNC 1 514	M. Sabeu, J.L. Uretsky	(BUCH, ANL)
BAUD	70	PL 31B 549	R. Baud *et al.*	(CERN Boson Spectrometer Collab.)
ANDERSON	69	PRL 22 1390	E.W. Anderson *et al.*	(BNL, CMU)
BOESEBECK	68	NP B4 501	K. Boesebeck *et al.*	(AACH, BERL, CERN)
HUSON	68	PL 28B 208	R. Huson *et al.*	(ORSAY, MILA, UCLA)
ALLES-...	67B	NC 50A 776	V. Alles-Borelli *et al.*	(CERN, BONN)
DANYSZ	67B	NC 51A 801	J.A. Danysz, B.R. French, V. Simak	(CERN)
CHIKOVANI	66	PL 22 233	G.E. Chikovani *et al.*	(SERP)
FOCACCI	66	PRL 17 890	M.N. Focacci *et al.*	(CERN)