$f_2(1565)$

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

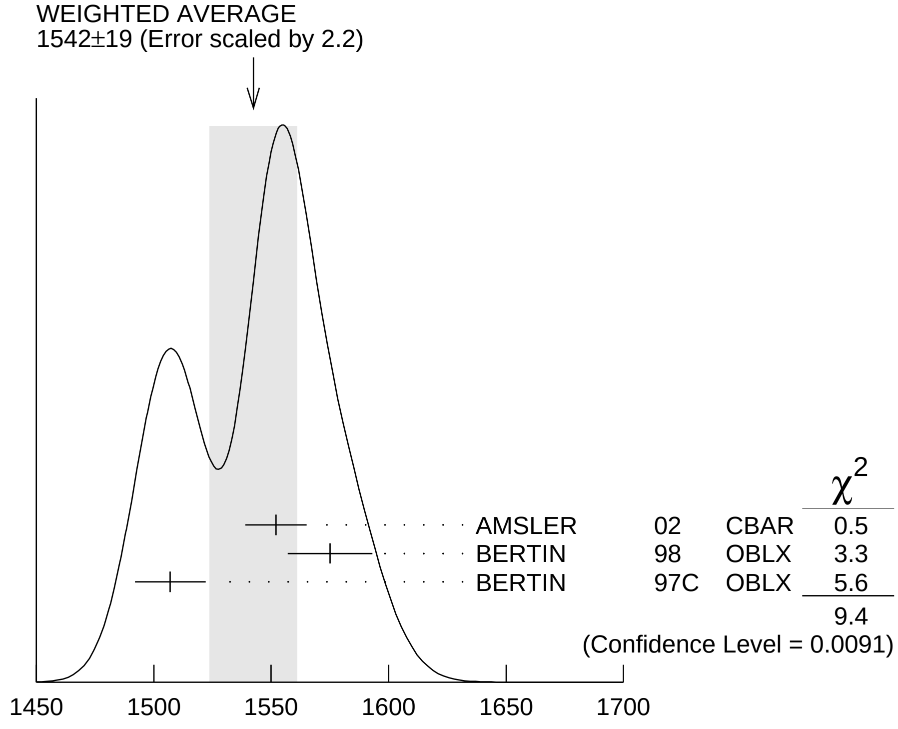
OMITTED FROM SUMMARY TABLE

Seen mostly in antinucleon-nucleon annihilation. Needs confirmation in other channels.

$f_2(1565)$ MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1542±19 OUR AVERAGE	Error includes scale factor of 2.2. See the ideogram below.			
1552±13	[1] AMSLER	02	CBAR	0.9 $\overline{p}p \rightarrow \pi^0\eta\eta$, $\pi^0\pi^0\pi^0$
1575±18	[1] BERTIN	98	OBLX	0.05–0.405 $\overline{n}p \rightarrow \pi^+\pi^+\pi^-$
1507±15	[1] BERTIN	97C	OBLX	0.0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1560±15	[2] ANISOVICH	09	RVUE	0.0 $\overline{p}p$, πN
1590±10	[3,4] AMELIN	06	VES	36 $\pi^- p \rightarrow \omega\omega n$
1550±10±20	[4] AMELIN	00	VES	37 $\pi^- p \rightarrow \eta\pi^+\pi^- n$
1598±11± 9	BAKER	99B	SPEC	0 $\overline{p}p \rightarrow \omega\omega\pi^0$
1534±20	[5] ABELE	96C	RVUE	Compilation
~ 1552	[6] AMSLER	95D	CBAR	0.0 $\overline{p}p \rightarrow \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$
1598±72	BALOSHIN	95	SPEC	40 π^- C $\rightarrow K^0_S K^0_S$ X
1566^{+80}_{-50}	[7] ANISOVICH	94	CBAR	0.0 $\overline{p}p \rightarrow 3\pi^0, \eta\eta\pi^0$
1502± 9	ADAMO	93	OBLX	$\overline{n}p \rightarrow \pi^+\pi^+\pi^-$
1488±10	[8] ARMSTRONG	93C	E760	$\overline{p}p \rightarrow \pi^0\eta\eta \rightarrow 6\gamma$
1508±10	[8] ARMSTRONG	93D	E760	$\overline{p}p \rightarrow 3\pi^0 \rightarrow 6\gamma$
1525±10	[8] ARMSTRONG	93D	E760	$\overline{p}p \rightarrow \eta\pi^0\pi^0 \rightarrow 6\gamma$
~ 1504	[9] WEIDENAUER	93	ASTE	0.0 $\overline{p}N \rightarrow 3\pi^- 2\pi^+$
1540±15	[8] ADAMO	92	OBLX	$\overline{n}p \rightarrow \pi^+\pi^+\pi^-$
1515±10	[10] AKER	91	CBAR	0.0 $\overline{p}p \rightarrow 3\pi^0$
1565±20	MAY	90	ASTE	0.0 $\overline{p}p \rightarrow \pi^+\pi^-\pi^0$
1477± 5	BRIDGES	86C	DBC	0.0 $\overline{p}N \rightarrow 3\pi^- 2\pi^+$

[1] T-matrix pole.
[2] On sheet II in a two-pole solution.
[3] Supersedes the $\omega\omega$ state of BELADIDZE 92B earlier assigned to the $f_2(1640)$.
[4] Breit-Wigner width.
[5] T-matrix pole, large coupling to $\rho\rho$ and $\omega\omega$, could be $f_2(1640)$.
[6] Coupled-channel analysis of AMSLER 95B, AMSLER 95C, and AMSLER 94D.
[7] From a simultaneous analysis of the annihilations $\overline{p}p \rightarrow 3\pi^0, \pi^0\eta\eta$ including AKER 91 data.
[8] J^P not determined, could be partly $f_0(1500)$.
[9] J^P not determined.
[10] Superseded by AMSLER 95B.



$f_2(1565)$ WIDTH

VALUE (MeV)		*DOCUMENT ID*		*TECN*	*COMMENT*
122± 13 OUR AVERAGE					
113± 23	[11]	AMSLER	02	CBAR	0.9 $\overline{p}p \to \pi^0\eta\eta$, $\pi^0\pi^0\pi^0$
119± 24	[11]	BERTIN	98	OBLX	0.05–0.405 $\overline{n}p \to \pi^+\pi^+\pi^-$
130± 20	[11]	BERTIN	97C	OBLX	0.0 $\overline{p}p \to \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
280± 40	[12]	ANISOVICH	09	RVUE	0.0 $\overline{p}p$, πN
140± 11	[13,14]	AMELIN	06	VES	36 $\pi^- p \to \omega\omega n$
130± 20±40	[14]	AMELIN	00	VES	37 $\pi^- p \to \eta\pi^+\pi^- n$
180± 60	[15]	ABELE	96C	RVUE	Compilation
~ 142	[16]	AMSLER	95D	CBAR	0.0 $\overline{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$
263±101		BALOSHIN	95	SPEC	40 $\pi^- C \to K^0_S K^0_S X$
166^{+80}_{-20}	[17]	ANISOVICH	94	CBAR	0.0 $\overline{p}p \to 3\pi^0$, $\eta\eta\pi^0$
130± 10	[18]	ADAMO	93	OBLX	$\overline{n}p \to \pi^+\pi^+\pi^-$
148± 27	[19]	ARMSTRONG	93C	E760	$\overline{p}p \to \pi^0\eta\eta \to 6\gamma$
103± 15	[19]	ARMSTRONG	93D	E760	$\overline{p}p \to 3\pi^0 \to 6\gamma$
111± 10	[19]	ARMSTRONG	93D	E760	$\overline{p}p \to \eta\pi^0\pi^0 \to 6\gamma$
~ 206	[20]	WEIDENAUER	93	ASTE	0.0 $\overline{p}N \to 3\pi^- 2\pi^+$
132± 37	[19]	ADAMO	92	OBLX	$\overline{n}p \to \pi^+\pi^+\pi^-$
120± 10	[21]	AKER	91	CBAR	0.0 $\overline{p}p \to 3\pi^0$
170± 40		MAY	90	ASTE	0.0 $\overline{p}p \to \pi^+\pi^-\pi^0$
116± 9		BRIDGES	86C	DBC	0.0 $\overline{p}N \to 3\pi^- 2\pi^+$

[11] T-matrix pole.
[12] On sheet II in a two-pole solution.
[13] Supersedes the $\omega\omega$ state of BELADIDZE 92B earlier assigned to the $f_2(1640)$.
[14] Breit-Wigner width.
[15] T-matrix pole, large coupling to $\rho\rho$ and $\omega\omega$, could be $f_2(1640)$.
[16] Coupled-channel analysis of AMSLER 95B, AMSLER 95C, and AMSLER 94D.
[17] From a simultaneous analysis of the annihilations $\overline{p}p \to 3\pi^0, \pi^0\eta\eta$ including AKER 91 data.
[18] Supersedes ADAMO 92.
[19] J^P not determined, could be partly $f_0(1500)$.
[20] J^P not determined.
[21] Superseded by AMSLER 95B.

$f_2(1565)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\pi\pi$	seen
Γ_2	$\pi^+\pi^-$	seen
Γ_3	$\pi^0\pi^0$	seen
Γ_4	$\rho^0\rho^0$	seen
Γ_5	$2\pi^+2\pi^-$	seen
Γ_6	$\eta\eta$	seen
Γ_7	$\omega\omega$	seen
Γ_8	$K\overline{K}$	seen
Γ_9	$\gamma\gamma$	seen

$f_2(1565)$ PARTIAL WIDTHS

$\Gamma(\eta\eta)$ Γ_6

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.2 ± 0.3	870	[22] SCHEGELSKY 06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

$\Gamma(K\overline{K})$ Γ_8

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.0 ± 1.0	870	[22] SCHEGELSKY 06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

$\Gamma(\gamma\gamma)$ Γ_9

VALUE (keV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.70 ± 0.14	870	[22] SCHEGELSKY 06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

[22] From analysis of L3 data at 91 and 183–209 GeV, using $f_2(1565)$ mass of 1570 MeV, width of 160 MeV, $\Gamma(\pi\pi) = 25$ MeV, and SU(3) relations.

$f_2(1565)$ BRANCHING RATIOS

$\Gamma(\pi\pi)/\Gamma_{total}$ — Γ_1/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
seen	BAKER	99B	SPEC	0 $\overline{p}p \to \omega\omega\pi^0$

$\Gamma(\pi^+\pi^-)/\Gamma_{total}$ — Γ_2/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 $\overline{n}p \to \pi^+\pi^+\pi^-$
not seen	[23] ANISOVICH	94B	RVUE	$\overline{p}p \to \pi^+\pi^-\pi^0$
seen	MAY	89	ASTE	$\overline{p}p \to \pi^+\pi^-\pi^0$

[23] ANISOVICH 94B is from a reanalysis of MAY 90.

$\Gamma(\pi^0\pi^0)/\Gamma_{total}$ — Γ_3/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
seen	AMSLER	95B	CBAR	0.0 $\overline{p}p \to 3\pi^0$

$\Gamma(\pi^+\pi^-)/\Gamma(\rho^0\rho^0)$ — Γ_2/Γ_4

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.042 ± 0.013	BRIDGES	86B	DBC	$\overline{p}N \to 3\pi^- 2\pi^+$

$\Gamma(\eta\eta)/\Gamma(\pi^0\pi^0)$ — Γ_6/Γ_3

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.024\pm0.005\pm0.012$	[24] ARMSTRONG	93C	E760	$\overline{p}p \to \pi^0\eta\eta \to 6\gamma$

[24] J^P not determined, could be partly $f_0(1500)$.

$\Gamma(\omega\omega)/\Gamma_{total}$ — Γ_7/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
seen	BAKER	99B	SPEC	0 $\overline{p}p \to \omega\omega\pi^0$

$f_2(1565)$ REFERENCES

ANISOVICH	09	IJMP A24 2481	V.V. Anisovich, A.V. Sarantsev	
AMELIN	06	PAN 69 690	D.V. Amelin et al.	(VES Collab.)
		Translated from YAF 69 715.		
SCHEGELSKY	06A	EPJ A27 207	V.A. Schegelsky et al.	
AMSLER	02	EPJ C23 29	C. Amsler et al.	
AMELIN	00	NP A668 83	D. Amelin et al.	(VES Collab.)
BAKER	99B	PL B467 147	C.A. Baker et al.	
BERTIN	98	PR D57 55	A. Bertin et al.	(OBELIX Collab.)
BERTIN	97C	PL B408 476	A. Bertin et al.	(OBELIX Collab.)
ABELE	96C	NP A609 562	A. Abele et al.	(Crystal Barrel Collab.)
AMSLER	95B	PL B342 433	C. Amsler et al.	(Crystal Barrel Collab.)
AMSLER	95C	PL B353 571	C. Amsler et al.	(Crystal Barrel Collab.)
AMSLER	95D	PL B355 425	C. Amsler et al.	(Crystal Barrel Collab.)
BALOSHIN	95	PAN 58 46	O.N. Baloshin et al.	(ITEP)
		Translated from YAF 58 50.		

AMSLER	94D	PL B333 277	C. Amsler *et al.*	(Crystal Barrel Collab.)
ANISOVICH	94	PL B323 233	V.V. Anisovich *et al.*	(Crystal Barrel Collab.)
ANISOVICH	94B	PR D50 1972	V.V. Anisovich *et al.*	(LOQM)
ADAMO	93	NP A558 13C	A. Adamo *et al.*	(OBELIX Collab.)
ARMSTRONG	93C	PL B307 394	T.A. Armstrong *et al.*	(FNAL, FERR, GENO+)
ARMSTRONG	93D	PL B307 399	T.A. Armstrong *et al.*	(FNAL, FERR, GENO+)
WEIDENAUER	93	ZPHY C59 387	P. Weidenauer *et al.*	(ASTERIX Collab.)
ADAMO	92	PL B287 368	A. Adamo *et al.*	(OBELIX Collab.)
BELADIDZE	92B	ZPHY C54 367	G.M. Beladidze *et al.*	(VES Collab.)
AKER	91	PL B260 249	E. Aker *et al.*	(Crystal Barrel Collab.)
MAY	90	ZPHY C46 203	B. May *et al.*	(ASTERIX Collab.)
MAY	89	PL B225 450	B. May *et al.*	(ASTERIX Collab.) IJP
BRIDGES	86B	PRL 56 215	D.L. Bridges *et al.*	(SYRA, CASE)
BRIDGES	86C	PRL 57 1534	D.L. Bridges *et al.*	(SYRA)