NODE=M123

$f_2(1565)$

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

OMITTED FROM SUMMARY TABLE

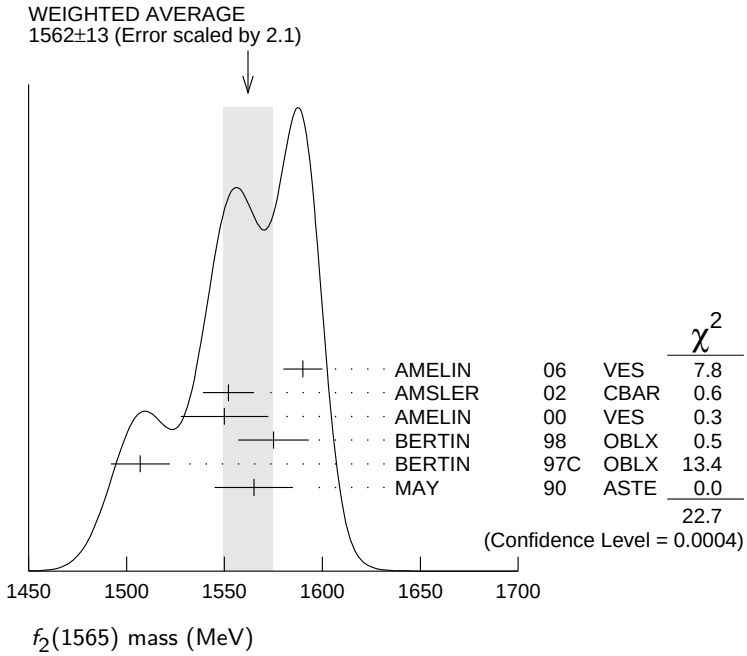
Seen mostly in antinucleon-nucleon annihilation. Needs confirmation in other channels. NODE=M123

$f_2(1565)$ MASS

NODE=M123M

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1562±13 OUR AVERAGE	Error includes scale factor of 2.1. See the ideogram below.			
1590±10	[1] AMELIN	06	VES	36 $\pi^- p \to \omega\omega n$
1552±13	[2] AMSLER	02	CBAR	0.9 $\bar{p}p \to \pi^0\eta\eta$, $\pi^0\pi^0\pi^0$
1550±10±20	AMELIN	00	VES	37 $\pi^- p \to \eta\pi^+\pi^- n$
1575±18	BERTIN	98	OBLX	0.05–0.405 $\bar{n}p \to \pi^+\pi^+\pi^-$
1507±15	[2] BERTIN	97C	OBLX	0.0 $\bar{p}p \to \pi^+\pi^-\pi^0$
1565±20	MAY	90	ASTE	0.0 $\bar{p}p \to \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1560±15	[3] ANISOVICH	09	RVUE	0.0 $\bar{p}p$, πN
1598±11± 9	BAKER	99B	SPEC	0 $\bar{p}p \to \omega\omega\pi^0$
1534±20	[4] ABELE	96C	RVUE	Compilation
∼ 1552	[5] AMSLER	95D	CBAR	0.0 $\bar{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$
1598±72	BALOSHIN	95	SPEC	40 π^- C $\to K^0_S K^0_S$ X
1566^{+80}_{-50}	[6] ANISOVICH	94	CBAR	0.0 $\bar{p}p \to 3\pi^0, \eta\eta\pi^0$
1502± 9	ADAMO	93	OBLX	$\bar{n}p \to \pi^+\pi^+\pi^-$
1488±10	[7] ARMSTRONG	93C	E760	$\bar{p}p \to \pi^0\eta\eta \to 6\gamma$
1508±10	[7] ARMSTRONG	93D	E760	$\bar{p}p \to 3\pi^0 \to 6\gamma$
1525±10	[7] ARMSTRONG	93D	E760	$\bar{p}p \to \eta\pi^0\pi^0 \to 6\gamma$ OCCUR=2
∼ 1504	[8] WEIDENAUER	93	ASTE	0.0 $\bar{p}N \to 3\pi^- 2\pi^+$
1540±15	[7] ADAMO	92	OBLX	$\bar{n}p \to \pi^+\pi^+\pi^-$
1515±10	[9] AKER	91	CBAR	0.0 $\bar{p}p \to 3\pi^0$
1477± 5	BRIDGES	86C	DBC	0.0 $\bar{p}N \to 3\pi^- 2\pi^+$

[1] Supersedes the $\omega\omega$ state of BELADIDZE 92B earlier assigned to the $f_2(1640)$. NODE=M123M;LINKAGE=AM
[2] T-matrix pole. NODE=M123M;LINKAGE=G
[3] On sheet II in a two-pole solution. NODE=M123M;LINKAGE=AN
[4] T-matrix pole, large coupling to $\rho\rho$ and $\omega\omega$, could be $f_2(1640)$. NODE=M123M;LINKAGE=AA
[5] Coupled-channel analysis of AMSLER 95B, AMSLER 95C, and AMSLER 94D. NODE=M123M;LINKAGE=AB
[6] From a simultaneous analysis of the annihilations $\bar{p}p \to 3\pi^0, \pi^0\eta\eta$ including AKER 91 data. NODE=M123M;LINKAGE=C
[7] J^P not determined, could be partly $f_0(1500)$. NODE=M123M;LINKAGE=E
[8] J^P not determined. NODE=M123M;LINKAGE=F
[9] Superseded by AMSLER 95B. NODE=M123M;LINKAGE=BA



$f_2(1565)$ WIDTH

NODE=M123W

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
134± 8 OUR AVERAGE				
140± 11	[10] AMELIN	06	VES	36 $\pi^- p \to \omega\omega n$
113± 23	[11] AMSLER	02	CBAR	0.9 $\bar{p}p \to \pi^0\eta\eta$, $\pi^0\pi^0\pi^0$
130± 20±40	AMELIN	00	VES	37 $\pi^- p \to \eta\pi^+\pi^- n$
119± 24	BERTIN	98	OBLX	0.05–0.405 $\bar{n}p \to \pi^+\pi^+\pi^-$
130± 20	[11] BERTIN	97C	OBLX	0.0 $\bar{p}p \to \pi^+\pi^-\pi^0$
170± 40	MAY	90	ASTE	0.0 $\bar{p}p \to \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
280± 40	[12] ANISOVICH	09	RVUE	0.0 $\bar{p}p$, πN
180± 60	[13] ABELE	96C	RVUE	Compilation
∼ 142	[14] AMSLER	95D	CBAR	0.0 $\bar{p}p \to \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$
263±101	BALOSHIN	95	SPEC	40 $\pi^- C \to K^0_S K^0_S X$
166^{+80}_{-20}	[15] ANISOVICH	94	CBAR	0.0 $\bar{p}p \to 3\pi^0, \eta\eta\pi^0$
130± 10	[16] ADAMO	93	OBLX	$\bar{n}p \to \pi^+\pi^+\pi^-$
148± 27	[17] ARMSTRONG	93C	E760	$\bar{p}p \to \pi^0\eta\eta \to 6\gamma$
103± 15	[17] ARMSTRONG	93D	E760	$\bar{p}p \to 3\pi^0 \to 6\gamma$
111± 10	[17] ARMSTRONG	93D	E760	$\bar{p}p \to \eta\pi^0\pi^0 \to 6\gamma$
∼ 206	[18] WEIDENAUER	93	ASTE	0.0 $\bar{p}N \to 3\pi^- 2\pi^+$
132± 37	[17] ADAMO	92	OBLX	$\bar{n}p \to \pi^+\pi^+\pi^-$
120± 10	[19] AKER	91	CBAR	0.0 $\bar{p}p \to 3\pi^0$
116± 9	BRIDGES	86C	DBC	0.0 $\bar{p}N \to 3\pi^- 2\pi^+$

[10] Supersedes the $\omega\omega$ state of BELADIDZE 92B earlier assigned to the $f_2(1640)$. NODE=M123W;LINKAGE=AM
[11] T-matrix pole. NODE=M123W;LINKAGE=G
[12] On sheet II in a two-pole solution. NODE=M123W;LINKAGE=AN
[13] T-matrix pole, large coupling to $\rho\rho$ and $\omega\omega$, could be $f_2(1640)$. NODE=M123W;LINKAGE=CC
[14] Coupled-channel analysis of AMSLER 95B, AMSLER 95C, and AMSLER 94D. NODE=M123W;LINKAGE=AB
[15] From a simultaneous analysis of the annihilations $\bar{p}p \to 3\pi^0, \pi^0\eta\eta$ including AKER 91 data. NODE=M123W;LINKAGE=D
[16] Supersedes ADAMO 92. NODE=M123W;LINKAGE=C
[17] J^P not determined, could be partly $f_0(1500)$. NODE=M123W;LINKAGE=E
[18] J^P not determined. NODE=M123W;LINKAGE=F
[19] Superseded by AMSLER 95B. NODE=M123W;LINKAGE=BA

$f_2(1565)$ DECAY MODES

NODE=M123215;NODE=M123

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$\pi\pi$	seen	DESIG=6;OUR EST;→ UNCHECKED ←
Γ_2	$\pi^+\pi^-$	seen	DESIG=1;OUR EST;→ UNCHECKED ←
Γ_3	$\pi^0\pi^0$	seen	DESIG=3;OUR EST;→ UNCHECKED ←
Γ_4	$\rho^0\rho^0$	seen	DESIG=2;OUR EST;→ UNCHECKED ←
Γ_5	$2\pi^+2\pi^-$	seen	DESIG=5;OUR EST;→ UNCHECKED ←
Γ_6	$\eta\eta$	seen	DESIG=4;OUR EST;→ UNCHECKED ←
Γ_7	$a_2(1320)\pi$		DESIG=8
Γ_8	$\omega\omega$	seen	DESIG=7;OUR EST;→ UNCHECKED ←
Γ_9	$K\overline{K}$		DESIG=9
Γ_{10}	$\gamma\gamma$		DESIG=10

$f_2(1565)$ PARTIAL WIDTHS

NODE=M123225

$\Gamma(\eta\eta)$ — Γ_6

NODE=M123W3
NODE=M123W3

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.2±0.3	870	[20] SCHEGELSKY	06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

$\Gamma(K\overline{K})$ — Γ_9

NODE=M123W1
NODE=M123W1

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.0±1.0	870	[20] SCHEGELSKY	06A	RVUE	$\gamma\gamma \to K^0_S K^0_S$

$\Gamma(\gamma\gamma)$ — Γ_{10}

NODE=M123W2
NODE=M123W2

VALUE (keV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.70 ± 0.14	870	[20] SCHEGELSKY 06A	RVUE	$\gamma\gamma \rightarrow K^0_S K^0_S$

[20] 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.

NODE=M123W1;LINKAGE=SC

$f_2(1565)$ BRANCHING RATIOS

NODE=M123220

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

NODE=M123R5
NODE=M123R5

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

$\Gamma(\pi^+\pi^-)/\Gamma_{total}$ — Γ_2/Γ

NODE=M123R1
NODE=M123R1

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 $\bar{n}p \rightarrow \pi^+\pi^+\pi^-$
not seen	[21] ANISOVICH 94B	RVUE	$\bar{p}p \rightarrow \pi^+\pi^-\pi^0$
seen	MAY 89	ASTE	$\bar{p}p \rightarrow \pi^+\pi^-\pi^0$

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

NODE=M123R1;LINKAGE=A

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

NODE=M123R3
NODE=M123R3

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

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

NODE=M123R2
NODE=M123R2

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

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

NODE=M123R4
NODE=M123R4

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$0.024 \pm 0.005 \pm 0.012$	[22] ARMSTRONG 93C	E760	$\bar{p}p \rightarrow \pi^0\eta\eta \rightarrow 6\gamma$

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

NODE=M123R4;LINKAGE=E

$\Gamma(\omega\omega)/\Gamma_{total}$ — Γ_8/Γ

NODE=M123R6
NODE=M123R6

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

$f_2(1565)$ REFERENCES

NODE=M123

ANISOVICH	09	IJMP A24 2481	V.V. Anisovich, A.V. Sarantsev		REFID=52719
AMELIN	06	PAN 69 690	D.V. Amelin *et al.*	(VES Collab.)	REFID=51574
		Translated from YAF 69 715.			
SCHEGELSKY	06A	EPJ A27 207	V.A. Schegelsky *et al.*		REFID=51185
AMSLER	02	EPJ C23 29	C. Amsler *et al.*		REFID=48580
AMELIN	00	NP A668 83	D. Amelin *et al.*	(VES Collab.)	REFID=47432
BAKER	99B	PL B467 147	C.A. Baker *et al.*		REFID=47398
BERTIN	98	PR D57 55	A. Bertin *et al.*	(OBELIX Collab.)	REFID=45782
BERTIN	97C	PL B408 476	A. Bertin *et al.*	(OBELIX Collab.)	REFID=45701
ABELE	96C	NP A609 562	A. Abele *et al.*	(Crystal Barrel Collab.)	REFID=45076
AMSLER	95B	PL B342 433	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=44377
AMSLER	95C	PL B353 571	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=44440
AMSLER	95D	PL B355 425	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=44441
BALOSHIN	95	PAN 58 46	O.N. Baloshin *et al.*	(ITEP)	REFID=44621
		Translated from YAF 58 50.			
AMSLER	94D	PL B333 277	C. Amsler *et al.*	(Crystal Barrel Collab.)	REFID=44093
ANISOVICH	94	PL B323 233	V.V. Anisovich *et al.*	(Crystal Barrel Collab.)	REFID=43659
ANISOVICH	94B	PR D50 1972	V.V. Anisovich *et al.*	(LOQM)	REFID=44071
ADAMO	93	NP A558 13C	A. Adamo *et al.*	(OBELIX Collab.)	REFID=43657
ARMSTRONG	93C	PL B307 394	T.A. Armstrong *et al.*	(FNAL, FERR, GENO+)	REFID=43587
ARMSTRONG	93D	PL B307 399	T.A. Armstrong *et al.*	(FNAL, FERR, GENO+)	REFID=43596
WEIDENAUER	93	ZPHY C59 387	P. Weidenauer *et al.*	(ASTERIX Collab.)	REFID=43585
ADAMO	92	PL B287 368	A. Adamo *et al.*	(OBELIX Collab.)	REFID=42177
BELADIDZE	92B	ZPHY C54 367	G.M. Beladidze *et al.*	(VES Collab.)	REFID=42172
AKER	91	PL B260 249	E. Aker *et al.*	(Crystal Barrel Collab.)	REFID=41587
MAY	90	ZPHY C46 203	B. May *et al.*	(ASTERIX Collab.)	REFID=41365
MAY	89	PL B225 450	B. May *et al.*	(ASTERIX Collab.) IJP	REFID=40921
BRIDGES	86B	PRL 56 215	D.L. Bridges *et al.*	(SYRA, CASE)	REFID=21376
BRIDGES	86C	PRL 57 1534	D.L. Bridges *et al.*	(SYRA)	REFID=21377