$f_2(1565)$

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

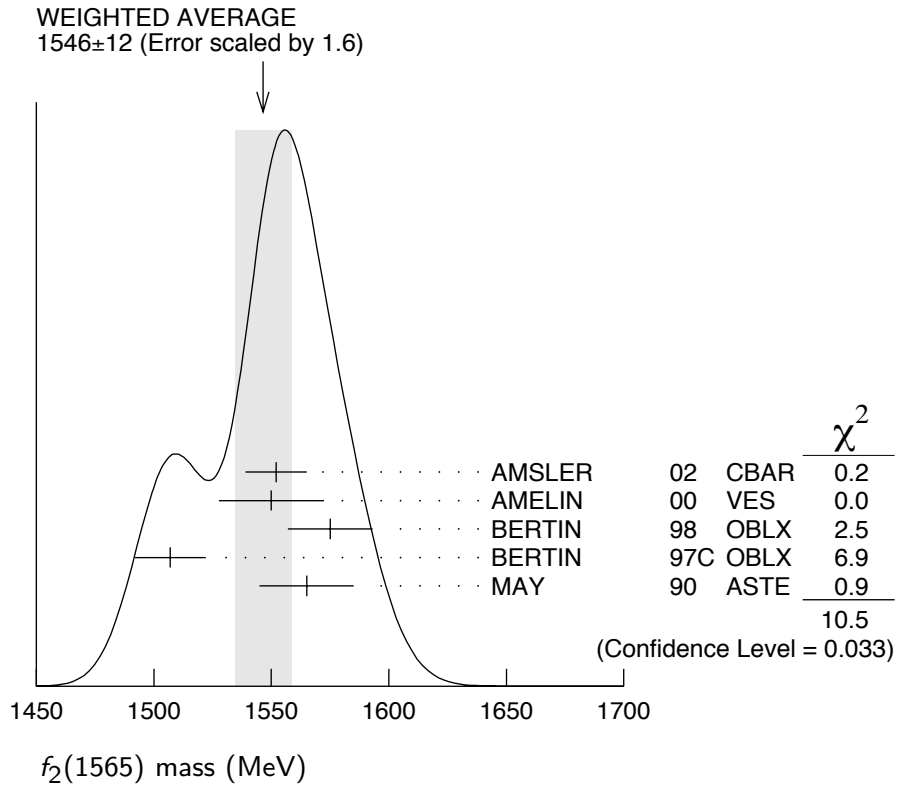## OMITTED FROM SUMMARY TABLE

Seen in antinucleon-nucleon annihilation at rest. Needs confirmation.

$f_2(1565)$ MASS

VALUE (MeV)			DOCUMENT ID		TECN	COMMENT
1546 $\pm$**12**		**OUR AVERAGE**	Error includes scale factor of 1.6. See the ideogram below.			
1552	± 13		[1] AMSLER	02	CBAR	$0.9\ \overline{p}p \to \pi^0\eta\eta,\ \pi^0\pi^0\pi^0$
1550	± 10	± 20	AMELIN	00	VES	$37\ \pi^- p \to \eta\pi^+\pi^- n$
1575	± 18		BERTIN	98	OBLX	0.05–$0.405\ \overline{n}p \to \pi^+\pi^+\pi^-$
1507	± 15		[1] BERTIN	97C	OBLX	$0.0\ \overline{p}p \to \pi^+\pi^-\pi^0$
1565	± 20		MAY	90	ASTE	$0.0\ \overline{p}p \to \pi^+\pi^-\pi^0$

$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$

1544.7	± 3.0		VLADIMIRSKII	00	SPEC	$40\ \pi^- p \to K^0_S K^0_S X$
1598	± 11	± 9	BAKER	99B	SPEC	$0\ \overline{p}p \to \omega\omega\pi^0$
1534	± 20		[2] ABELE	96C	RVUE	Compilation
~ 1552			[3] AMSLER	95D	CBAR	$0.0\ \overline{p}p \to \pi^0\pi^0\pi^0,\ \pi^0\eta\eta,\ \pi^0\pi^0\eta$
1598	± 72		BALOSHIN	95	SPEC	$40\ \pi^- C \to K^0_S K^0_S X$
1566	$^{+80}_{-50}$		[4] ANISOVICH	94	CBAR	$0.0\ \overline{p}p \to 3\pi^0, \eta\eta\pi^0$
1502	± 9		ADAMO	93	OBLX	$\overline{n}p \to \pi^+\pi^+\pi^-$
1488	± 10		[5] ARMSTRONG	93C	E760	$\overline{p}p \to \pi^0\eta\eta \to 6\gamma$
1508	± 10		[5] ARMSTRONG	93D	E760	$\overline{p}p \to 3\pi^0 \to 6\gamma$
1525	± 10		[5] ARMSTRONG	93D	E760	$\overline{p}p \to \eta\pi^0\pi^0 \to 6\gamma$
~ 1504			[6] WEIDENAUER	93	ASTE	$0.0\ \overline{p}N \to 3\pi^- 2\pi^+$
1540	± 15		[5] ADAMO	92	OBLX	$\overline{n}p \to \pi^+\pi^+\pi^-$
1515	± 10		[7] AKER	91	CBAR	$0.0\ \overline{p}p \to 3\pi^0$
1477	± 5		BRIDGES	86C	DBC	$0.0\ \overline{p}N \to 3\pi^- 2\pi^+$

[1] T-matrix pole.

[2] T-matrix pole, large coupling to $\rho\rho$ and $\omega\omega$, could be $f_2(1640)$.

[3] Coupled-channel analysis of AMSLER 95B, AMSLER 95C, and AMSLER 94D.

[4] From a simultaneous analysis of the annihilations $\overline{p}p \to 3\pi^0, \pi^0\eta\eta$ including AKER 91 data.

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

[6] J^P not determined.

[7] Superseded by AMSLER 95B.

WEIGHTED AVERAGE
1546±12 (Error scaled by 1.6)

			χ^2
AMSLER	02	CBAR	0.2
AMELIN	00	VES	0.0
BERTIN	98	OBLX	2.5
BERTIN	97C	OBLX	6.9
MAY	90	ASTE	0.9
			10.5

(Confidence Level = 0.033)

1450   1500   1550   1600   1650   1700

$f_2(1565)$ mass (MeV)

$f_2(1565)$ WIDTH

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
126 ± 12 OUR AVERAGE				
113 ± 23	[8] AMSLER	02	CBAR	$0.9\ \overline{p}p \to \pi^0\eta\eta,$ $\pi^0\pi^0\pi^0$
130 ± 20 ±40	AMELIN	00	VES	$37\ \pi^- p \to \eta\pi^+\pi^- n$
119 ± 24	BERTIN	98	OBLX	$0.05\text{–}0.405\ \overline{n}p \to$ $\pi^+\pi^+\pi^-$
130 ± 20	[8] BERTIN	97C	OBLX	$0.0\ \overline{p}p \to \pi^+\pi^-\pi^0$
170 ± 40	MAY	90	ASTE	$0.0\ \overline{p}p \to \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
10.3± 3.0	VLADIMIRSKII	00	SPEC	$40\ \pi^- p \to K_S^0 K_S^0 X$
180 ± 60	[9] ABELE	96C	RVUE	Compilation
∼ 142	[10] 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	$40\ \pi^- C \to K_S^0 K_S^0 X$
166 $^{+80}_{-20}$	[11] ANISOVICH	94	CBAR	$0.0\ \overline{p}p \to 3\pi^0,\eta\eta\pi^0$
130 ± 10	[12] ADAMO	93	OBLX	$\overline{n}p \to \pi^+\pi^+\pi^-$
148 ± 27	[13] ARMSTRONG	93C	E760	$\overline{p}p \to \pi^0\eta\eta \to 6\gamma$
103 ± 15	[13] ARMSTRONG	93D	E760	$\overline{p}p \to 3\pi^0 \to 6\gamma$
111 ± 10	[13] ARMSTRONG	93D	E760	$\overline{p}p \to \eta\pi^0\pi^0 \to 6\gamma$
∼ 206	[14] WEIDENAUER	93	ASTE	$0.0\ \overline{p}N \to 3\pi^- 2\pi^+$
132 ± 37	[13] ADAMO	92	OBLX	$\overline{n}p \to \pi^+\pi^+\pi^-$
120 ± 10	[15] AKER	91	CBAR	$0.0\ \overline{p}p \to 3\pi^0$
116 ± 9	BRIDGES	86C	DBC	$0.0\ \overline{p}N \to 3\pi^- 2\pi^+$

[8] T-matrix pole.

[9] T-matrix pole, large coupling to $\rho\rho$ and $\omega\omega$, could be $f_2(1640)$.

[10] Coupled-channel analysis of AMSLER 95B, AMSLER 95C, and AMSLER 94D.

[11] From a simultaneous analysis of the annihilations $\overline{p}p \rightarrow 3\pi^0, \pi^0\eta\eta$ including AKER 91 data.

[12] Supersedes ADAMO 92.

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

[14] J^P not determined.

[15] 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	$a_2(1320)\pi$	
Γ_8	$\omega\omega$	seen

$f_2(1565)$ 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		$0\ \overline{p}p \rightarrow \omega\omega\pi^0$

$\Gamma(\pi^+\pi^-)/\Gamma_{total}$ 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–$0.405\ \overline{n}p \rightarrow \pi^+\pi^+\pi^-$
not seen	[16] ANISOVICH 94B RVUE		$\overline{p}p \rightarrow \pi^+\pi^-\pi^0$
seen	MAY 89 ASTE		$\overline{p}p \rightarrow \pi^+\pi^-\pi^0$

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

$\Gamma(\pi^+\pi^-)/\Gamma(\rho^0\rho^0)$ 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		$\overline{p}N \rightarrow 3\pi^-2\pi^+$

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

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.024\pm0.005\pm0.012$	[17] ARMSTRONG	93C	E760	$\overline{p}p \to \pi^0\eta\eta \to 6\gamma$

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

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

AMSLER	02	EPJ C23 29	C. Amsler et al.	
AMELIN	00	NP A668 83	D. Amelin et al.	(VES Collab.)
VLADIMIRSKII	00	JETPL 26 486	V.V. Vladimirskii et al.	
		Translated from ZETFP 72 698.		
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.)
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)

—————— OTHER RELATED PAPERS ——————

| ANISOVICH | 05 | JETPL 80 715 | V.V. Anisovich | |
| | | Translated from ZETFP 80 845. | | |