NODE=M135

$f_2(1950)$

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

$f_2(1950)$ MASS

NODE=M135205

NODE=M135M

VALUE (MeV)	DOCUMENT ID		TECN	CHG	COMMENT
1944±12 OUR AVERAGE	Error includes scale factor of 1.5. See the ideogram below.				
1930±25	[1] BINON	05	GAMS		33 $\pi^- p \to \eta\eta n$
2010±25	ANISOVICH	00J	SPEC		
1940±50	BAI	00A	BES		$J/\psi \to \gamma(\pi^+\pi^-\pi^+\pi^-)$
1980±22	[2] BARBERIS	00C			450 $pp \to pp4\pi$
1940±22	[3] BARBERIS	00C			450 $pp \to pp2\pi 2\pi^0$
1980±50	ANISOVICH	99B	SPEC		1.35–1.94 $p\overline{p} \to \eta\eta\pi^0$
1960±30	BARBERIS	97B	OMEG		450 $pp \to pp2(\pi^+\pi^-)$
1918±12	ANTINORI	95	OMEG		300,450 $pp \to pp2(\pi^+\pi^-)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1980± 2±14	ABE	04	BELL		10.6 $e^+e^- \to e^+e^-K^+K^-$
1867±46	[4] AMSLER	02	CBAR		0.9 $\overline{p}p \to \pi^0\eta\eta$, $\pi^0\pi^0\pi^0$
∼ 1996	HASAN	94	RVUE		$\overline{p}p \to \pi\pi$
∼ 1990	[5] OAKDEN	94	RVUE		0.36–1.55 $\overline{p}p \to \pi\pi$
1950±15	[6] ASTON	91	LASS	0	11 $K^- p \to \Lambda K\overline{K}\pi\pi$

OCCUR=2

[1] First solution, PWA is ambiguous. NODE=M135M;LINKAGE=BI

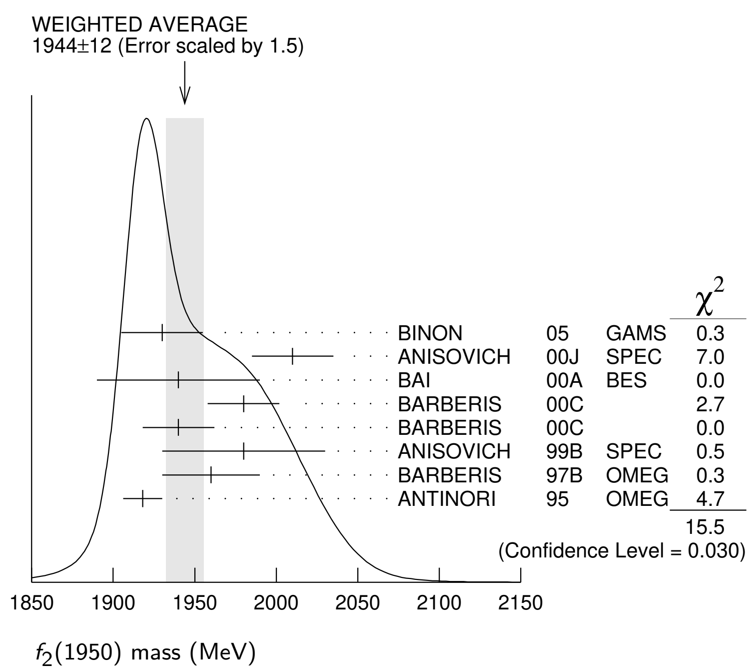
[2] Decaying into $\pi^+\pi^-2\pi^0$. NODE=M135M;LINKAGE=A4

[3] Decaying into $2(\pi^+\pi^-)$. NODE=M135M;LINKAGE=B4

[4] T-matrix pole. NODE=M135M;LINKAGE=TT

[5] From solution B of amplitude analysis of data on $\overline{p}p \to \pi\pi$. See however KLOET 96 who fit $\pi^+\pi^-$ only and find waves only up to $J = 3$ to be important but not significantly resonant. NODE=M135M;LINKAGE=BB

[6] Cannot determine spin to be 2. NODE=M135M;LINKAGE=A



$f_2(1950)$ WIDTH

NODE=M135210

NODE=M135W

VALUE (MeV)	DOCUMENT ID		TECN	CHG	COMMENT
472± 18 OUR AVERAGE					
450± 50	[7] BINON	05	GAMS		33 $\pi^- p \to \eta\eta n$
495± 35	ANISOVICH	00J	SPEC		
380^{+120}_{-90}	BAI	00A	BES		$J/\psi \to \gamma(\pi^+\pi^-\pi^+\pi^-)$
520± 50	[8] BARBERIS	00C			450 $pp \to pp4\pi$

485 ± 55	[9] BARBERIS	00C			450 $pp \to ~pp4\pi$	OCCUR=2
500 ± 100	ANISOVICH	99B	SPEC		1.35–1.94 $p\overline{p} \to ~\eta\eta\pi^0$	
460 ± 40	BARBERIS	97B	OMEG		450 $pp \to ~pp2(\pi^+\pi^-)$	
390 ± 60	ANTINORI	95	OMEG		300,450 $pp \to ~pp2(\pi^+\pi^-)$	

• • • We do not use the following data for averages, fits, limits, etc. • • •

297 ± 12 ± 6	ABE	04	BELL		10.6 $e^+e^- \to ~e^+e^-K^+K^-$	
385 ± 58	[10] AMSLER	02	CBAR		0.9 $\overline{p}p \to ~\pi^0\eta\eta,~\pi^0\pi^0\pi^0$	
∼ 134	HASAN	94	RVUE		$\overline{p}p \to ~\pi\pi$	
∼ 100	[11] OAKDEN	94	RVUE		0.36–1.55 $\overline{p}p \to ~\pi\pi$	
250 ± 50	[12] ASTON	91	LASS	0	11 $K^-p \to ~\Lambda K\overline{K}\pi\pi$	

[7] First solution, PWA is ambiguous. NODE=M135W;LINKAGE=BI
[8] Decaying into $\pi^+\pi^-2\pi^0$. NODE=M135W;LINKAGE=A4
[9] Decaying into $2(\pi^+\pi^-)$. NODE=M135W;LINKAGE=B4
[10] T-matrix pole. NODE=M135W;LINKAGE=TT
[11] From solution B of amplitude analysis of data on $\overline{p}p \to ~\pi\pi$. See however KLOET 96 who fit $\pi^+\pi^-$ only and find waves only up to $J=3$ to be important but not significantly resonant. NODE=M135W;LINKAGE=BB
[12] Cannot determine spin to be 2. NODE=M135W;LINKAGE=A

$f_2(1950)$ DECAY MODES

NODE=M135215;NODE=M135

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$K^*(892)\overline{K}^*(892)$	seen	DESIG=1
Γ_2	$\pi^+\pi^-$	seen	DESIG=2;OUR EST;→ NOT CHECKED ←
Γ_3	4π	seen	DESIG=7;OUR EST;→ NOT CHECKED ←
Γ_4	$\pi^+\pi^-\pi^+\pi^-$		DESIG=3
Γ_5	$a_2(1320)\pi$		DESIG=4
Γ_6	$f_2(1270)\pi\pi$		DESIG=5
Γ_7	$\eta\eta$	seen	DESIG=6;OUR EST;→ NOT CHECKED ←
Γ_8	$K\overline{K}$	seen	DESIG=8;OUR EST;→ NOT CHECKED ←
Γ_9	$\gamma\gamma$	seen	DESIG=9;OUR EST;→ NOT CHECKED ←

$f_2(1950)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

NODE=M135225

$\Gamma(K\overline{K}) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_8\Gamma_9/\Gamma$

NODE=M135G1
NODE=M135G1

VALUE (eV)	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
122 ± 4 ± 26	[13] ABE	04	BELL	10.6 $e^+e^- \to ~e^+e^-K^+K^-$

[13] Assuming spin 2. NODE=M135G1;LINKAGE=AB

$f_2(1950)$ BRANCHING RATIOS

NODE=M135220

$\Gamma(K^*(892)\overline{K}^*(892))/\Gamma_{\text{total}}$ Γ_1/Γ

NODE=M135R1
NODE=M135R1

VALUE	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
seen	ASTON	91	LASS	0	11 $K^-p \to ~\Lambda K\overline{K}\pi\pi$

$\Gamma(a_2(1320)\pi)/\Gamma_{\text{total}}$ Γ_5/Γ

NODE=M135R3
NODE=M135R3

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	BARBERIS	00B		450 $pp \to ~p_f\eta\pi^+\pi^-p_s$
not seen	BARBERIS	00C		450 $pp \to ~p_f4\pi p_s$
possibly seen	BARBERIS	97B	OMEG	450 $pp \to ~pp2(\pi^+\pi^-)$

$\Gamma(\eta\eta)/\Gamma(4\pi)$ Γ_7/Γ_3

NODE=M135R5
NODE=M135R5

VALUE	*CL%*	*DOCUMENT ID*		*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<5.0 \times 10^{-3}$	90	BARBERIS	00E	450 $pp \to ~p_f\eta\eta p_s$

$\Gamma(\eta\eta)/\Gamma(\pi^+\pi^-)$ Γ_7/Γ_2

NODE=M135R6

NODE=M135R6

VALUE	DOCUMENT ID		TECN	COMMENT
0.14±0.05	AMSLER	02	CBAR	0.9 $\overline{p}p \rightarrow \pi^0\eta\eta$, $\pi^0\pi^0\pi^0$

f_2(1950) REFERENCES

NODE=M135

BINON	05	PAN 68 960	F. Binon *et al.*		REFID=50780
		Translated from YAF 68 998.			
ABE	04	EPJ C32 323	K. Abe *et al.*	(BELLE Collab.)	REFID=49650
AMSLER	02	EPJ C23 29	C. Amsler *et al.*		REFID=48580
ANISOVICH	00J	PL B491 47	A.V. Anisovich *et al.*		REFID=47950
BAI	00A	PL B472 207	J.Z. Bai *et al.*	(BES Collab.)	REFID=47426
BARBERIS	00B	PL B471 435	D. Barberis *et al.*	(WA 102 Collab.)	REFID=47958
BARBERIS	00C	PL B471 440	D. Barberis *et al.*	(WA 102 Collab.)	REFID=47959
BARBERIS	00E	PL B479 59	D. Barberis *et al.*	(WA 102 Collab.)	REFID=47961
ANISOVICH	99B	PL B449 154	A.V. Anisovich *et al.*		REFID=46886
BARBERIS	97B	PL B413 217	D. Barberis *et al.*	(WA 102 Collab.)	REFID=45758
KLOET	96	PR D53 6120	W.M. Kloet, F. Myhrer	(RUTG, NORD)	REFID=45212
ANTINORI	95	PL B353 589	F. Antinori *et al.*	(ATHU, BARI, BIRM+) JP	REFID=44437
HASAN	94	PL B334 215	A. Hasan, D.V. Bugg	(LOQM)	REFID=44103
OAKDEN	94	NP A574 731	M.N. Oakden, M.R. Pennington	(DURH)	REFID=45210
ASTON	91	NPBPS B21 5	D. Aston *et al.*	(LASS Collab.)	REFID=41746

OTHER RELATED PAPERS

ANISOVICH	05	JETPL 80 715	V.V. Anisovich		REFID=50772
		Translated from ZETFP 80 845.			
ANISOVICH	05A	JETPL 81 417	V.V. Anisovich, A.V. Sarantsev		REFID=50771
		Translated from ZETFP 81 531.			
ANISOVICH	05C	IJMP A20 6327	V.V. Anisovich, M.A. Matveev, A.V. Sarantsev		REFID=50959
LONGACRE	04	PR D70 094041	R.S. Longacre, S.J. Lindenbaum		REFID=50341
ALBRECHT	88N	PL B212 528	H. Albrecht *et al.*	(ARGUS Collab.)	REFID=41576
ALBRECHT	87Q	PL B198 255	H. Albrecht *et al.*	(ARGUS Collab.)	REFID=41575
ARMSTRONG	87C	ZPHY C34 33	T.A. Armstrong *et al.*	(CERN, BIRM, BARI+)	REFID=41577