$f_2(1810)$

$$I^G(J^{PC}) = 0^+(2^{++})$$
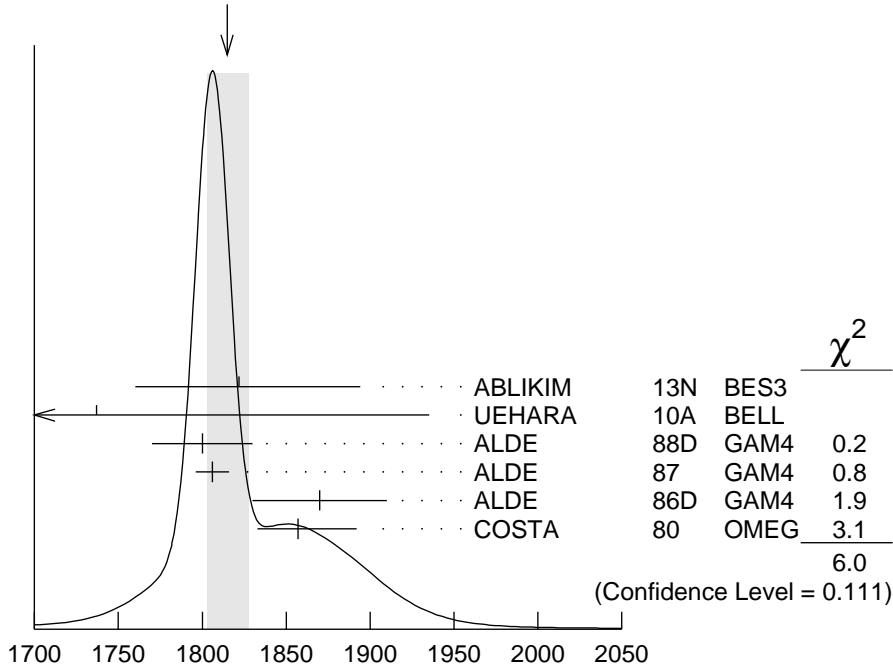
OMITTED FROM SUMMARY TABLE
Needs confirmation.

$f_2(1810)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
1815±12 OUR AVERAGE		Error includes scale factor of 1.4. See the ideogram below.			
$1822^{+29}_{-24}{}^{+\ 66}_{-\ 57}$	5.5k	[1] ABLIKIM	13N	BES3	$e^+e^- \to J/\psi \to \gamma\eta\eta$
$1737\pm\ 9^{+198}_{-\ 65}$		[2] UEHARA	10A	BELL	10.6 $e^+e^- \to e^+e^-\eta\eta$
1800 ± 30	40	ALDE	88D	GAM4	300 $\pi^- p \to \pi^- p 4\pi^0$
1806 ± 10	1600	ALDE	87	GAM4	100 $\pi^- p \to 4\pi^0 n$
1870 ± 40		[3] ALDE	86D	GAM4	100 $\pi^- p \to \eta\eta n$
1857^{+35}_{-24}		[4] COSTA	80	OMEG	10 $\pi^- p \to K^+ K^- n$

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

1858^{+18}_{-71}		[5] LONGACRE	86	RVUE	Compilation
1799 ± 15		[6] CASON	82	STRC	8 $\pi^+ p \to \Delta^{++}\pi^0\pi^0$

WEIGHTED AVERAGE
1815±12 (Error scaled by 1.4)

			χ^2
ABLIKIM	13N	BES3	
UEHARA	10A	BELL	
ALDE	88D	GAM4	0.2
ALDE	87	GAM4	0.8
ALDE	86D	GAM4	1.9
COSTA	80	OMEG	3.1
			6.0

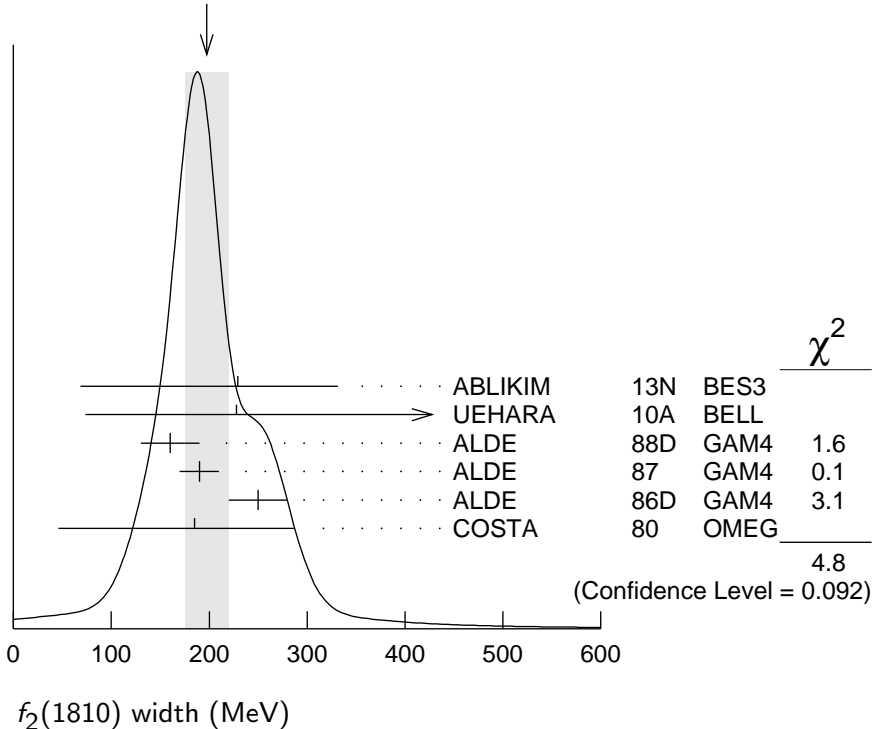(Confidence Level = 0.111)

$f_2(1810)$ mass (MeV)

[1] From partial wave analysis including all possible combinations of 0^{++}, 2^{++}, and 4^{++} resonances.
[2] Breit-Wigner mass.
[3] Seen in only one solution.

[4] Error increased by spread of two solutions. Included in LONGACRE 86 global analysis.
[5] From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.
[6] From an amplitude analysis of the reaction $\pi^+\pi^- \to 2\pi^0$. The resonance in the $2\pi^0$ final state is not confirmed by PROKOSHKIN 97.

$f_2(1810)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
197± 22 OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.			
$229^{+\ 52}_{-\ 42}{}^{+\ 88}_{-155}$	5.5k	[7] ABLIKIM	13N	BES3	$e^+e^- \to J/\psi \to \gamma\eta\eta$
$228^{+\ 21}_{-\ 20}{}^{+234}_{-153}$		[8] UEHARA	10A	BELL	$10.6\ e^+e^- \to e^+e^-\eta\eta$
160 ± 30	40	ALDE	88D	GAM4	$300\ \pi^-p \to \pi^-p4\pi^0$
190 ± 20	1600	ALDE	87	GAM4	$100\ \pi^-p \to 4\pi^0 n$
250 ± 30		[9] ALDE	86D	GAM4	$100\ \pi^-p \to \eta\eta n$
185^{+102}_{-139}		[10] COSTA	80	OMEG	$10\ \pi^-p \to K^+K^- n$

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

$388^{+\ 15}_{-\ 21}$		[11] LONGACRE	86	RVUE	Compilation
$280^{+\ 42}_{-\ 35}$		[12] CASON	82	STRC	$8\ \pi^+p \to \Delta^{++}\pi^0\pi^0$

WEIGHTED AVERAGE
197±22 (Error scaled by 1.5)

			χ^2
ABLIKIM	13N	BES3	
UEHARA	10A	BELL	
ALDE	88D	GAM4	1.6
ALDE	87	GAM4	0.1
ALDE	86D	GAM4	3.1
COSTA	80	OMEG	
			4.8

(Confidence Level = 0.092)

$f_2(1810)$ width (MeV)

[7] From partial wave analysis including all possible combinations of 0^{++}, 2^{++}, and 4^{++} resonances.
[8] Breit-Wigner width.

[9] Seen in only one solution.

[10] Error increased by spread of two solutions. Included in LONGACRE 86 global analysis.

[11] From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

[12] From an amplitude analysis of the reaction $\pi^+\pi^- \to 2\pi^0$. The resonance in the $2\pi^0$ final state is not confirmed by PROKOSHKIN 97.

$f_2(1810)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\pi\pi$	
Γ_2	$\eta\eta$	seen
Γ_3	$4\pi^0$	seen
Γ_4	K^+K^-	
Γ_5	$\gamma\gamma$	seen

$f_2(1810)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(\eta\eta) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_2\Gamma_5/\Gamma$

VALUE (eV)	DOCUMENT ID		TECN	COMMENT
$5.2^{+0.9+37.3}_{-0.8-\ 4.5}$	[13] UEHARA	10A	BELL	10.6 $e^+e^- \to e^+e^-\eta\eta$

[13] Including interference with the $f_2'(1525)$ (parameters fixed to the values from the 2008 edition of this review, PDG 08) and $f_2(1270)$. May also be the $f_0(1500)$.

$f_2(1810)$ BRANCHING RATIOS

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

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	AMSLER	02	CBAR	0.9 $\overline{p}p \to \pi^0\eta\eta,\ \pi^0\pi^0\pi^0$
not seen	PROKOSHKIN 97		GAM2	38 $\pi^-p \to \pi^0\pi^0 n$
$0.21^{+0.02}_{-0.03}$	[14] LONGACRE	86	RVUE	Compilation
0.44 ± 0.03	[15] CASON	82	STRC	8 $\pi^+p \to \Delta^{++}\pi^0\pi^0$

[14] From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

[15] Included in LONGACRE 86 global analysis.

$\Gamma(\eta\eta)/\Gamma_{\text{total}}$ Γ_2/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
seen	ABLIKIM	13N	BES3	PWA of $J/\psi \to \gamma\eta\eta$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.008^{+0.028}_{-0.003}$	[16] LONGACRE	86	RVUE	Compilation

[16] From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

$\Gamma(\pi\pi)/\Gamma(4\pi^0)$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_1/Γ_3

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.75	ALDE	87	GAM4	100 $\pi^- p \rightarrow 4\pi^0 n$

$\Gamma(4\pi^0)/\Gamma(\eta\eta)$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_3/Γ_2

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.8±0.3	ALDE	87	GAM4	100 $\pi^- p \rightarrow 4\pi^0 n$

$\Gamma(K^+ K^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_4/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.003^{+0.019}_{-0.002}$	[17] LONGACRE	86	RVUE	Compilation
seen	COSTA	80	OMEG	10 $\pi^- p \rightarrow K^+ K^- n$

[17] From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

$f_2(1810)$ REFERENCES

ABLIKIM	13N	PR D87 092009	Ablikim M. *et al.*	(BES III Collab.)
UEHARA	10A	PR D82 114031	S. Uehara *et al.*	(BELLE Collab.)
PDG	08	PL B667 1	C. Amsler *et al.*	(PDG Collab.)
AMSLER	02	EPJ C23 29	C. Amsler *et al.*	
PROKOSHKIN	97	PD 42 117	Y.D. Prokoshkin *et al.*	(SERP)
		Translated from DANS 353 323.		
ALDE	88D	SJNP 47 810	D.M. Alde *et al.*	(SERP, BELG, LANL, LAPP+)
		Translated from YAF 47 1273.		
ALDE	87	PL B198 286	D.M. Alde *et al.*	(LANL, BRUX, SERP, LAPP)
ALDE	86D	NP B269 485	D.M. Alde *et al.*	(BELG, LAPP, SERP, CERN+)
LONGACRE	86	PL B177 223	R.S. Longacre *et al.*	(BNL, BRAN, CUNY+)
CASON	82	PRL 48 1316	N.M. Cason *et al.*	(NDAM, ANL)
COSTA	80	NP B175 402	G. Costa *et al.*	(BARI, BONN, CERN, GLAS+)