

$f_2(1810)$

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

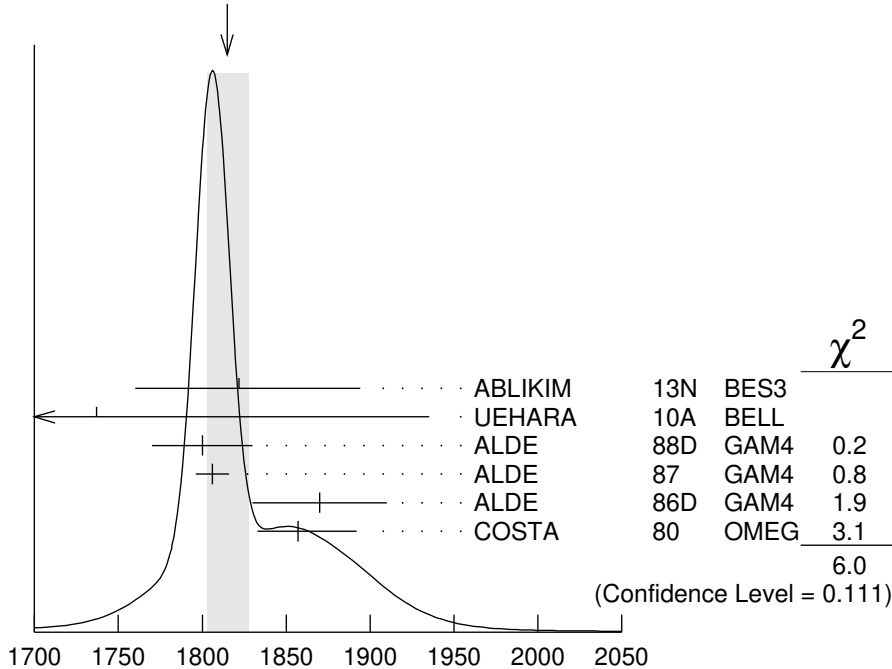
OMITTED FROM SUMMARY TABLE

Needs confirmation.

$f_2(1810)$ MASS

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1815 ±12	OUR AVERAGE	Error includes scale factor of 1.4. See the ideogram below.		
1822 $\begin{smallmatrix} +29 \\ -24 \end{smallmatrix}$	$\begin{smallmatrix} +66 \\ -57 \end{smallmatrix}$	5.5k	1 ABLIKIM 13N BES3	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\eta\eta$
1737 ± 9	$\begin{smallmatrix} +198 \\ -65 \end{smallmatrix}$		2 UEHARA 10A BELL	$10.6 e^+e^- \rightarrow e^+e^-\eta\eta$
1800 ±30	40	ALDE 88D	GAM4	300 $\pi^-p \rightarrow \pi^-p4\pi^0$
1806 ±10	1600	ALDE 87	GAM4	100 $\pi^-p \rightarrow 4\pi^0n$
1870 ±40		3 ALDE 86D	GAM4	100 $\pi^-p \rightarrow \eta\eta n$
1857 $\begin{smallmatrix} +35 \\ -24 \end{smallmatrix}$		4 COSTA 80	OMEG	10 $\pi^-p \rightarrow K^+K^-n$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
1845.0 ± 2.2 $\begin{smallmatrix} + \\ - \end{smallmatrix}$	$\begin{smallmatrix} 1.6 \\ 7.2 \end{smallmatrix}$	5 ALBRECHT 20	RVUE	0.9 $\bar{p}p \rightarrow \pi^0\pi^0\eta, \pi^0\eta\eta, \pi^0K^+K^-$
1858 $\begin{smallmatrix} +18 \\ -71 \end{smallmatrix}$		6 LONGACRE 86	RVUE	Compilation
1799 ±15		7 CASON 82	STRC	8 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

WEIGHTED AVERAGE
1815±12 (Error scaled by 1.4)



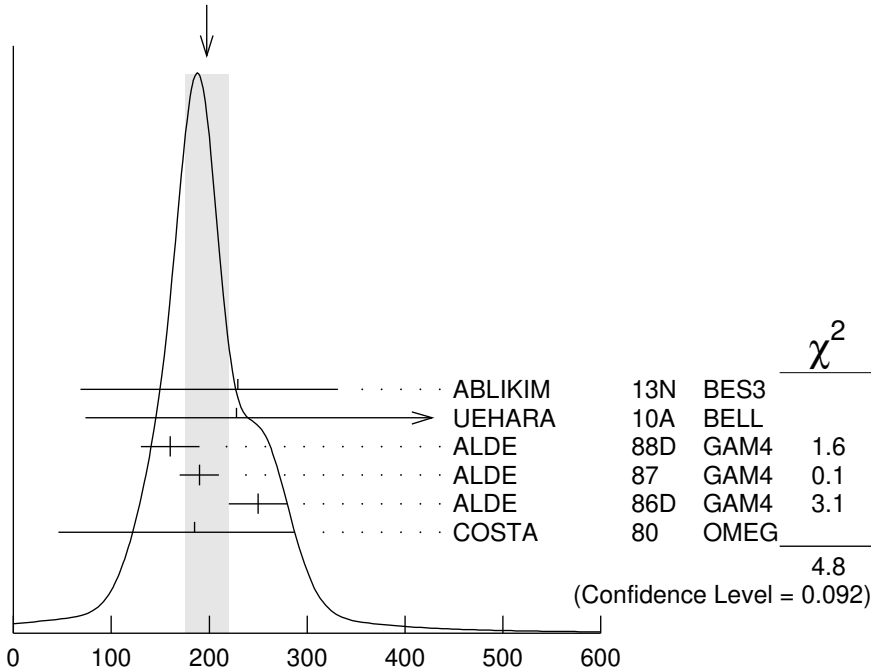
¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.

- ² Breit-Wigner mass. Could also be the $f_2(1910)$.
³ Seen in only one solution.
⁴ Error increased by spread of two solutions. Included in LONGACRE 86 global analysis.
⁵ T-matrix pole, 4 poles, 4 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\bar{K}$), BINON 83 ($\eta\eta$).
⁶ From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.
⁷ From an amplitude analysis of the reaction $\pi^+\pi^-\rightarrow 2\pi^0$. The resonance in the $2\pi^0$ final state is not confirmed by PROKOSHKIN 97.
 $f_2(1810)$ mass (MeV)

$f_2(1810)$ 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	1 ABLIKIM 13N	BES3 $e^+e^- \rightarrow J/\psi \rightarrow \gamma\eta\eta$
228 +21 -20	+234 -153		2 UEHARA 10A	BELL $10.6 e^+e^- \rightarrow e^+e^-\eta\eta$
160 ± 30	40	ALDE 88D	GAM4	300 $\pi^-p \rightarrow \pi^-p4\pi^0$
190 ± 20	1600	ALDE 87	GAM4	100 $\pi^-p \rightarrow 4\pi^0n$
250 ± 30		3 ALDE 86D	GAM4	100 $\pi^-p \rightarrow \eta\eta n$
185 +102 -139		4 COSTA 80	OMEG	10 $\pi^-p \rightarrow K^+K^-n$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
260.9 ± 3.9	+199.9 -38.2	5 ALBRECHT 20	RVUE	0.9 $\bar{p}p \rightarrow \pi^0\pi^0\eta, \pi^0\eta\eta, \pi^0K^+K^-$
388 +15 -21		6 LONGACRE 86	RVUE	Compilation
280 +42 -35		7 CASON 82	STRC	8 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

WEIGHTED AVERAGE
 197±22 (Error scaled by 1.5)



- ¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.
² Breit-Wigner width. Could also be the $f_2(1910)$.
³ Seen in only one solution.
⁴ Error increased by spread of two solutions. Included in LONGACRE 86 global analysis.
⁵ T-matrix pole, 4 poles, 4 channels, including scattering data from HYAMS 75 ($\pi\pi$), LONGACRE 86 ($K\bar{K}$), BINON 83 ($\eta\eta$).
⁶ From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.
⁷ From an amplitude analysis of the reaction $\pi^+\pi^-\rightarrow 2\pi^0$. The resonance in the $2\pi^0$ final state is not confirmed by PROKOSHKIN 97.
 $f_2(1810)$ width (MeV)

$f_2(1810)$ 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
$5.2^{+0.9+37.3}_{-0.8-4.5}$	¹ UEHARA 10A BELL 10.6 $e^+e^- \rightarrow e^+e^-\eta\eta$

¹ 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 $\bar{p}p \rightarrow \pi^0\eta\eta, \pi^0\pi^0\pi^0$
not seen	PROKOSHKIN 97 GAM2 38 $\pi^-p \rightarrow \pi^0\pi^0n$
$0.21^{+0.02}_{-0.03}$	¹ LONGACRE 86 RVUE Compilation
0.44 ± 0.03	² CASON 82 STRC 8 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

¹ From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

² 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 $J/\psi \rightarrow \gamma\eta\eta$

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

$0.008^{+0.028}_{-0.003}$ ¹ LONGACRE 86 RVUE Compilation

¹ From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

$\Gamma(\pi\pi)/\Gamma(4\pi^0)$ 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 $\pi^- p \rightarrow 4\pi^0 n$

$\Gamma(4\pi^0)/\Gamma(\eta\eta)$ 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 $\pi^- p \rightarrow 4\pi^0 n$

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

VALUE DOCUMENT ID TECN COMMENT

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

$0.003^{+0.019}_{-0.002}$ ¹ LONGACRE 86 RVUE Compilation

seen COSTA 80 OMEG 10 $\pi^- p \rightarrow K^+K^- n$

¹ 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

ALBRECHT	20	EPJ C80 453	M. Albrecht <i>et al.</i>	(Crystal Barrel Collab.)
ABLIKIM	13N	PR D87 092009	M. Ablikim <i>et al.</i>	(BESIII Collab.)
UEHARA	10A	PR D82 114031	S. Uehara <i>et al.</i>	(BELLE Collab.)
PDG	08	PL B667 1	C. Amsler <i>et al.</i>	(PDG Collab.)
AMSLER	02	EPJ C23 29	C. Amsler <i>et al.</i>	
PROKOSHKIN	97	PD 42 117	Y.D. Prokoshkin <i>et al.</i>	(SERP)
		Translated from DANS 353 323.		
ALDE	88D	SJNP 47 810	D.M. Alde <i>et al.</i>	(SERP, BELG, LANL, LAPP+)
		Translated from YAF 47 1273.		
ALDE	87	PL B198 286	D.M. Alde <i>et al.</i>	(LANL, BRUX, SERP, LAPP)
ALDE	86D	NP B269 485	D.M. Alde <i>et al.</i>	(BELG, LAPP, SERP, CERN+)
LONGACRE	86	PL B177 223	R.S. Longacre <i>et al.</i>	(BNL, BRAN, CUNY+)
BINON	83	NC 78A 313	F.G. Binon <i>et al.</i>	(BELG, LAPP, SERP+)
CASON	82	PRL 48 1316	N.M. Cason <i>et al.</i>	(NDAM, ANL)
COSTA	80	NP B175 402	G. Costa <i>et al.</i>	(BARI, BONN, CERN, GLAS+)
HYAMS	75	NP B100 205	B.D. Hyams <i>et al.</i>	(CERN, MPIM)