

$f_2(1810)$

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

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 ⁺²⁹ ₋₂₄ + ⁶⁶ ₋₅₇	5.5k	¹ ABLIKIM	13N BES3	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\eta\eta$
1737 ± 9 ⁺¹⁹⁸ ₋₆₅		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 ⁺³⁵ ₋₂₄		⁴ COSTA...	80 OMEG	10 $\pi^-p \rightarrow K^+K^-n$
● ● ● 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 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

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

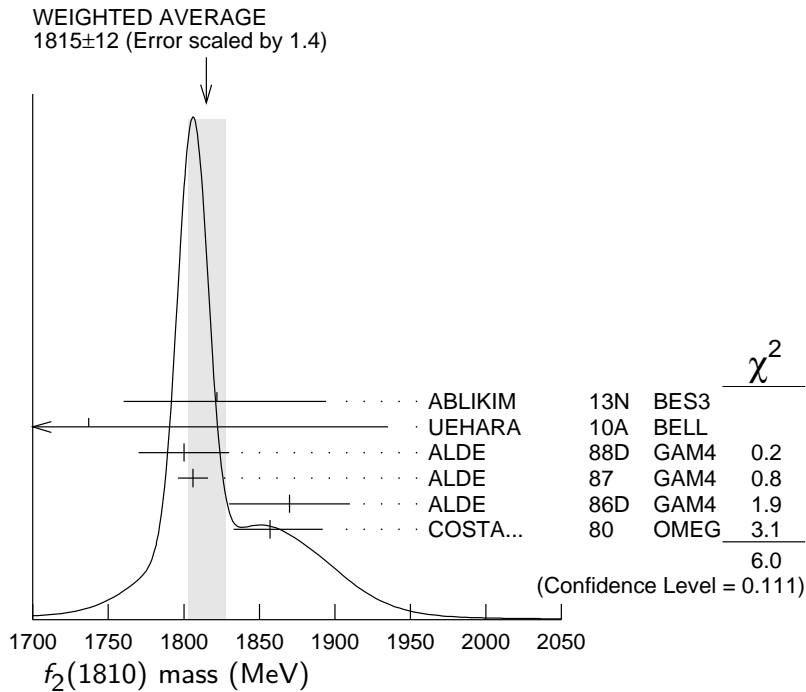
² Breit-Wigner mass.

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 $\pi^+\pi^- \rightarrow 2\pi^0$. 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\pm 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	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\eta\eta$
228 $^{+21}_{-20}$ $^{+234}_{-153}$		⁸ UEHARA	10A BELL	10.6 $e^+e^- \rightarrow e^+e^-\eta\eta$
160 \pm 30	40	ALDE	88D GAM4	300 $\pi^-p \rightarrow \pi^-p4\pi^0$
190 \pm 20	1600	ALDE	87 GAM4	100 $\pi^-p \rightarrow 4\pi^0n$
250 \pm 30		⁹ ALDE	86D GAM4	100 $\pi^-p \rightarrow \eta\eta n$
185 $^{+102}_{-139}$		¹⁰ COSTA...	80 OMEG	10 $\pi^-p \rightarrow K^+K^-n$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
388 $^{+15}_{-21}$		¹¹ LONGACRE	86 RVUE	Compilation
280 $^{+42}_{-35}$		¹² CASON	82 STRC	8 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

⁷ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.

⁸ Breit-Wigner width.

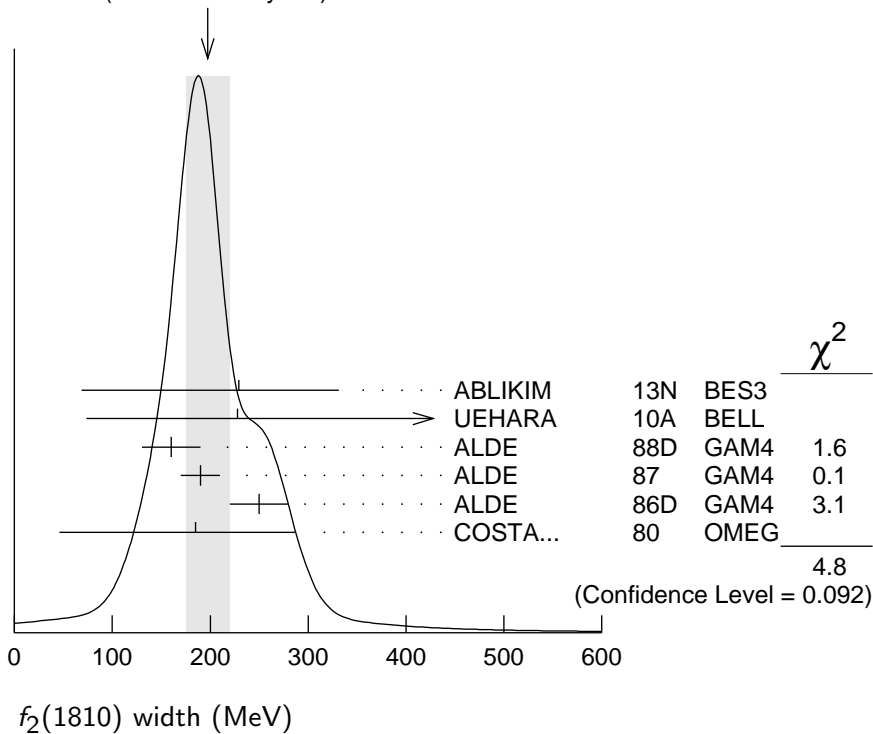
⁹ Seen in only one solution.

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 $\pi^+\pi^- \rightarrow 2\pi^0$. The resonance in the $2\pi^0$ final state is not confirmed by PROKOSHKIN 97.

WEIGHTED AVERAGE
197 \pm 22 (Error scaled by 1.5)



$f_2(1810)$ 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 $e^+e^- \rightarrow e^+e^-\eta\eta$

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 $\bar{p}p \rightarrow \pi^0\eta\eta, \pi^0\pi^0\pi^0$
not seen	PROKOSHKIN 97 GAM2 38 $\pi^-p \rightarrow \pi^0\pi^0n$
$0.21^{+0.02}_{-0.03}$	¹⁴ LONGACRE 86 RVUE Compilation
0.44 ± 0.03	¹⁵ CASON 82 STRC 8 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

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 $J/\psi \rightarrow \gamma\eta\eta$
• • •	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.

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

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.8 ± 0.3	ALDE	87	GAM4 100 $\pi^- p \rightarrow 4\pi^0 n$

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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. <i>et al.</i>	(BES III 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	SPD 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+)
CASON	82	PRL 48 1316	N.M. Cason <i>et al.</i>	(NDAM, ANL)
COSTA...	80	NP B175 402	G. Costa de Beaugard <i>et al.</i>	(BARI, BONN+)