

NODE=M038

$f_2(1810)$

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

OMITTED FROM SUMMARY TABLE
Needs confirmation.

NODE=M038

NODE=M038M

NODE=M038M

$f_2(1810)$ 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 $e^+e^- \rightarrow J/\psi \rightarrow \gamma\eta\eta$
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. • • •

1845.0 ± 2.2 ^{+1.6} _{-7.2}		5 ALBRECHT	20 RVUE	0.9 $\bar{p}p \rightarrow \pi^0\pi^0\eta, \pi^0\eta\eta, \pi^0K^+K^-$
1858 ⁺¹⁸ ₋₇₁		6 LONGACRE	86 RVUE	Compilation
1799 ±15		7 CASON	82 STRC	$8 \pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

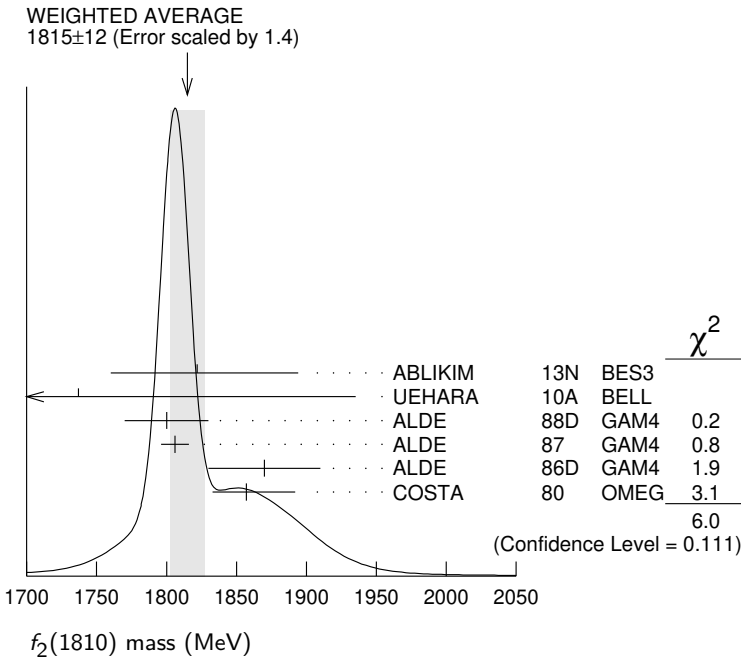
- ¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.
- ² Breit-Wigner mass. Could also be the $f_2(1910)$.
- ³ Seen in only one solution.
- ⁴ Error increased by spread of two solutions. Included in LONGACRE 86 global analysis.
- ⁵ T-matrix pole, 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.

NODE=M038M;LINKAGE=B

NODE=M038M;LINKAGE=UE
NODE=M038M;LINKAGE=F
NODE=M038M;LINKAGE=A
NODE=M038M;LINKAGE=C

NODE=M038M;LINKAGE=L

NODE=M038M;LINKAGE=P1

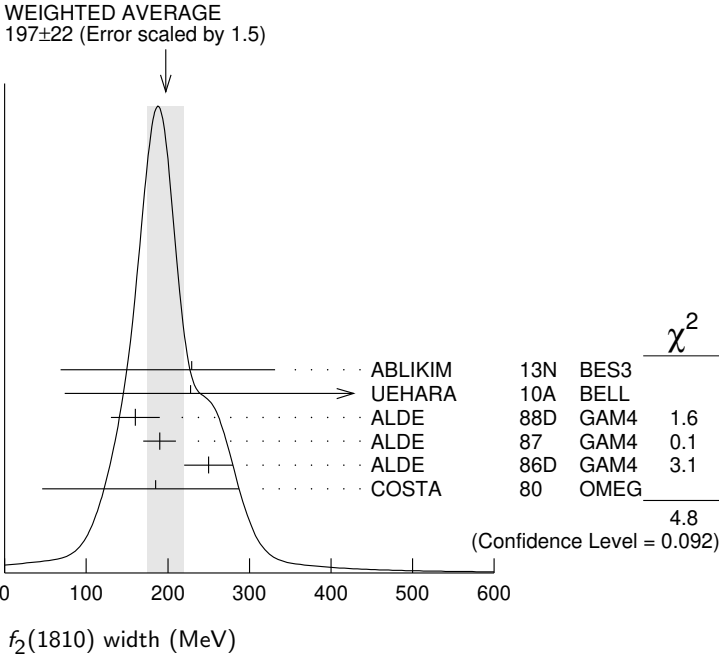


$f_2(1810)$ WIDTH

NODE=M038W

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	$8 \pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

- 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.



$f_2(1810)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \quad \pi\pi$	seen
$\Gamma_2 \quad \eta\eta$	seen
$\Gamma_3 \quad 4\pi^0$	seen
$\Gamma_4 \quad K^+K^-$	seen
$\Gamma_5 \quad \gamma\gamma$	seen

NODE=M038W

NODE=M038W;LINKAGE=B

NODE=M038W;LINKAGE=UE
NODE=M038W;LINKAGE=F
NODE=M038W;LINKAGE=A
NODE=M038W;LINKAGE=C

NODE=M038W;LINKAGE=L

NODE=M038W;LINKAGE=P1

NODE=M038215;NODE=M038

DESIG=2;OUR EST;→ UNCHECKED ←
DESIG=3
DESIG=4;OUR EST;→ UNCHECKED ←
DESIG=1;OUR EST;→ UNCHECKED ←
DESIG=5;OUR EST;→ UNCHECKED ←

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

NODE=M038225

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

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
$5.2^{+0.9}_{-0.8} + 37.3_{-4.5}$	¹ UEHARA	10A	BELL 10.6 $e^+ e^- \rightarrow e^+ e^- \eta\eta$

NODE=M038G01
 NODE=M038G01

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 $f_0(1500)$.

NODE=M038G01;LINKAGE=UE

 $f_2(1810)$ BRANCHING RATIOS

NODE=M038220

 $\Gamma(\pi\pi) / \Gamma_{\text{total}}$ 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 $\pi^- p \rightarrow \pi^0 \pi^0 n$
$0.21^{+0.02}_{-0.03}$	¹ LONGACRE	86	RVUE Compilation
0.44 ± 0.03	² CASON	82	STRC 8 $\pi^+ p \rightarrow \Delta^{++} \pi^0 \pi^0$

NODE=M038R2
 NODE=M038R2

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

NODE=M038R2;LINKAGE=L

² Included in LONGACRE 86 global analysis.

NODE=M038R;LINKAGE=C

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

NODE=M038R3
 NODE=M038R3

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

NODE=M038R3;LINKAGE=L

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

NODE=M038R4
 NODE=M038R4

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

NODE=M038R5
 NODE=M038R5

 $\Gamma(K^+ K^-) / \Gamma_{\text{total}}$ 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 $\pi^- p \rightarrow K^+ K^- n$

NODE=M038R1
 NODE=M038R1

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

NODE=M038R1;LINKAGE=L

 $f_2(1810)$ REFERENCES

NODE=M038

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>	(Crystal Barrel Collab.)
PROKOSHKIN	97	PD 42 117	Y.D. Prokoshkin <i>et al.</i>	(SERP)
ALDE	88D	Translated from DANS 353 323.	D.M. Alde <i>et al.</i>	(SERP, BELG, LANL, LAPP+)
ALDE	87	SJNP 47 810	D.M. Alde <i>et al.</i>	(LANL, BRUX, SERP, LAPP)
ALDE	86D	Translated from YAF 47 1273.	D.M. Alde <i>et al.</i>	(BELG, LAPP, SERP, CERN+)
LONGACRE	86	PL B198 286	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)

REFID=60439
 REFID=55387
 REFID=53641
 REFID=52166
 REFID=48580
 REFID=45386
 REFID=44652
 REFID=40221
 REFID=20765
 REFID=20768
 REFID=20750
 REFID=20746
 REFID=20737
 REFID=20355