

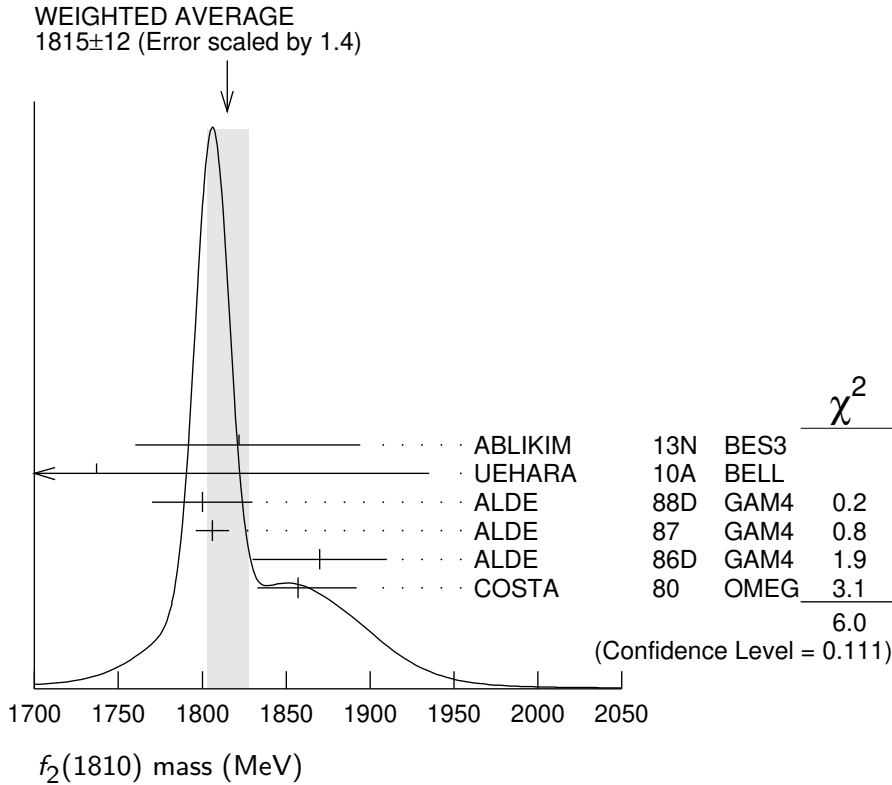
# $f_2(1810)$

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

OMITTED FROM SUMMARY TABLE  
Needs confirmation.

## $f_2(1810)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1815 ± 12</b>	<b>OUR AVERAGE</b>	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 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$



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

<sup>2</sup> Breit-Wigner mass. Could also be the  $f_2(1910)$ .

<sup>3</sup> Seen in only one solution.

<sup>4</sup> Error increased by spread of two solutions. Included in LONGACRE 86 global analysis.

<sup>5</sup> T-matrix pole, 4 poles, 4 channels, including scattering data from HYAMS 75 ( $\pi\pi$ ), LONGACRE 86 ( $K\bar{K}$ ), BINON 83 ( $\eta\eta$ ).

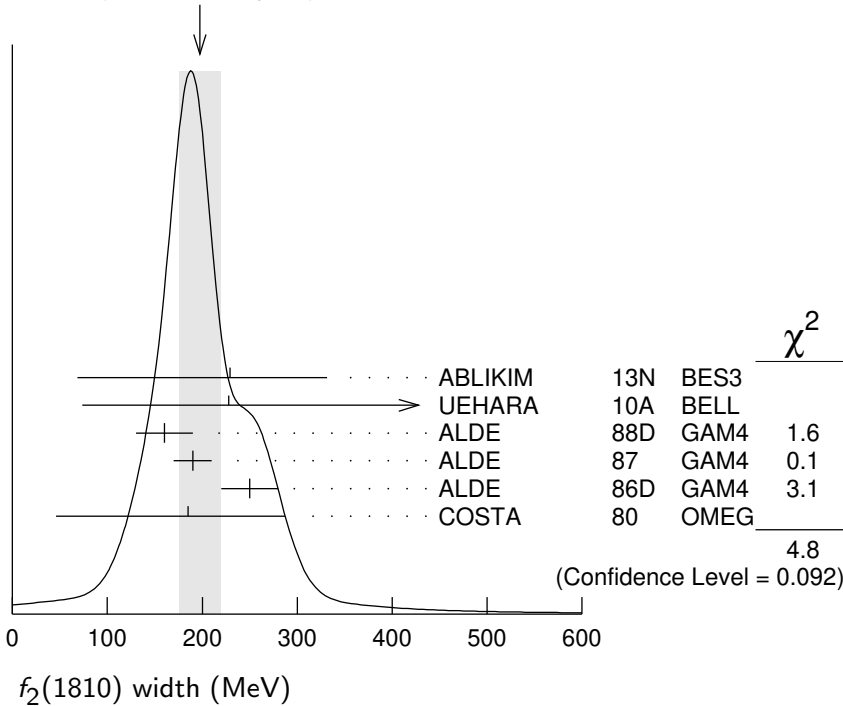
<sup>6</sup> From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

<sup>7</sup> 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
<b>197 ± 22</b>	<b>OUR AVERAGE</b>	Error includes scale factor of 1.5. See the ideogram below.		
229 <sup>+52</sup> / <sub>-42</sub> <sup>+88</sup> / <sub>-155</sub>	5.5k	<sup>1</sup> ABLIKIM	13N BES3	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\eta\eta$
228 <sup>+21</sup> / <sub>-20</sub> <sup>+234</sup> / <sub>-153</sub>		<sup>2</sup> 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		<sup>3</sup> ALDE	86D GAM4	100 $\pi^-p \rightarrow \eta\eta n$
185 <sup>+102</sup> / <sub>-139</sub>		<sup>4</sup> 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 <sup>+199.9</sup> / <sub>-38.2</sub>		<sup>5</sup> ALBRECHT	20 RVUE	0.9 $\bar{p}p \rightarrow \pi^0\pi^0\eta, \pi^0\eta\eta, \pi^0K^+K^-$
388 <sup>+15</sup> / <sub>-21</sub>		<sup>6</sup> LONGACRE	86 RVUE	Compilation
280 <sup>+42</sup> / <sub>-35</sub>		<sup>7</sup> CASON	82 STRC	8 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

WEIGHTED AVERAGE  
197±22 (Error scaled by 1.5)



- <sup>1</sup> From partial wave analysis including all possible combinations of  $0^{++}$ ,  $2^{++}$ , and  $4^{++}$  resonances.  
<sup>2</sup> Breit-Wigner width. Could also be the  $f_2(1910)$ .  
<sup>3</sup> Seen in only one solution.  
<sup>4</sup> Error increased by spread of two solutions. Included in LONGACRE 86 global analysis.  
<sup>5</sup> T-matrix pole, 4 poles, 4 channels, including scattering data from HYAMS 75 ( $\pi\pi$ ), LONGACRE 86 ( $K\bar{K}$ ), BINON 83 ( $\eta\eta$ ).  
<sup>6</sup> From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.  
<sup>7</sup> 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 ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $\pi\pi$	seen
$\Gamma_2$ $\eta\eta$	seen
$\Gamma_3$ $4\pi^0$	seen
$\Gamma_4$ $K^+K^-$	seen
$\Gamma_5$ $\gamma\gamma$	seen

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

$\Gamma(\eta\eta) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	$\Gamma_2\Gamma_5/\Gamma$
VALUE (eV) $5.2^{+0.9+37.3}_{-0.8-4.5}$	<sup>1</sup> UEHARA	10A	BELL	10.6 $e^+e^-\rightarrow e^+e^-\eta\eta$

<sup>1</sup> 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

$\Gamma(\pi\pi)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	$\Gamma_1/\Gamma$
VALUE				
• • • 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	$38 \pi^-p \rightarrow \pi^0\pi^0n$
$0.21^{+0.02}_{-0.03}$	<sup>1</sup> LONGACRE	86	RVUE	Compilation
$0.44 \pm 0.03$	<sup>2</sup> CASON	82	STRC	$8 \pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$

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

<sup>2</sup> Included in LONGACRE 86 global analysis.

$\Gamma(\eta\eta)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	$\Gamma_2/\Gamma$
VALUE				
seen	ABLIKIM	13N	BES3	PWA of $J/\psi \rightarrow \gamma\eta\eta$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.008^{+0.028}_{-0.003}$	<sup>1</sup> LONGACRE	86	RVUE	Compilation

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

$\Gamma(\pi\pi)/\Gamma(4\pi^0)$   $\Gamma_1/\Gamma_3$

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

$\Gamma(4\pi^0)/\Gamma(\eta\eta)$   $\Gamma_3/\Gamma_2$

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

$\Gamma(K^+K^-)/\Gamma_{\text{total}}$   $\Gamma_4/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.003^{+0.019}_{-0.002}$	<sup>1</sup> LONGACRE	86	RVUE Compilation
seen	COSTA	80	OMEG 10 $\pi^- p \rightarrow K^+ K^- n$

<sup>1</sup> 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>	(Crystal Barrel Collab.)
PROKOSHKIN	97	PD 42 117	Y.D. Prokoshkin <i>et al.</i>	(SERP)
ALDE	88D	SJNP 47 810	D.M. Alde <i>et al.</i>	(SERP, BELG, LANL, LAPP+)
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)