

$f_2(1810)$

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

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. | | | | |
| $1737 \pm 9^{+198}_{-65}$ | | ¹ 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 | | ² ALDE | 86D GAM4 | 100 $\pi^-p \rightarrow \eta\eta n$ |
| 1857^{+35}_{-24} | | ³ 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} | | ⁴ LONGACRE | 86 RVUE | Compilation |
| 1799 ± 15 | | ⁵ CASON | 82 STRC | 8 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$ |

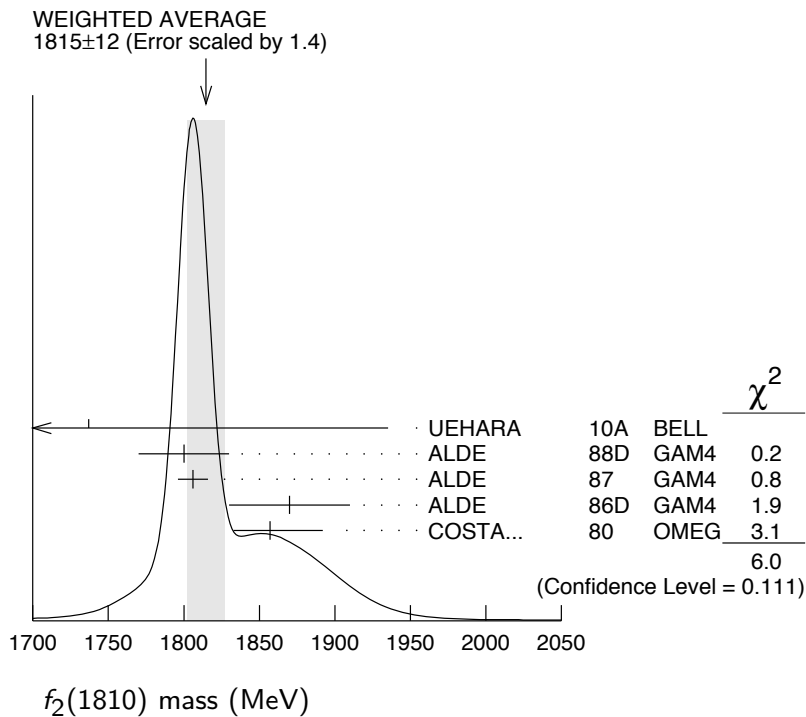
¹ Breit-Wigner mass.

² Seen in only one solution.

³ Error increased by spread of two solutions. Included in LONGACRE 86 global analysis.

⁴ From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

⁵ 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\pm22 OUR AVERAGE | | Error includes scale factor of 1.5. See the ideogram below. | | |
| 228 $^{+21}_{-20}$ | 234 | ⁶ 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 | | ⁷ ALDE | 86D GAM4 | 100 $\pi^-p \rightarrow \eta\eta n$ |
| 185 $^{+102}_{-139}$ | | ⁸ COSTA... | 80 OMEG | 10 $\pi^-p \rightarrow K^+K^-n$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | | |
| 388 $^{+15}_{-21}$ | | ⁹ LONGACRE | 86 RVUE | Compilation |
| 280 $^{+42}_{-35}$ | | ¹⁰ CASON | 82 STRC | 8 $\pi^+p \rightarrow \Delta^{++}\pi^0\pi^0$ |

⁶ Breit-Wigner width.

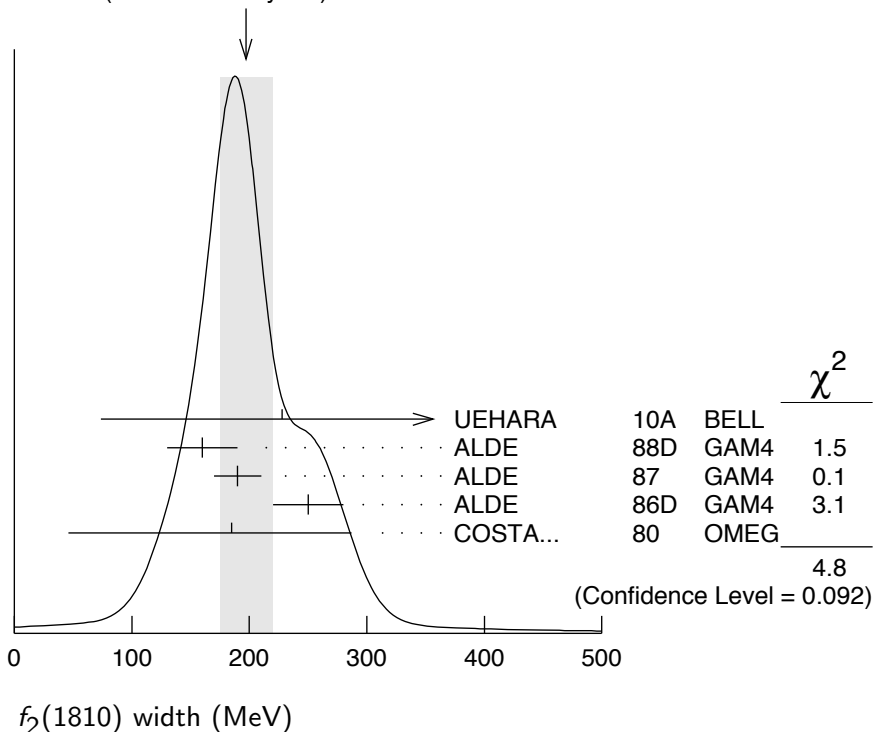
⁷ Seen in only one solution.

⁸ Error increased by spread of two solutions. Included in LONGACRE 86 global analysis.

⁹ From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

¹⁰ 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 $\eta\eta$ | |
| 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 |
| $5.2^{+0.9}_{-0.8} + 37.3 - 4.5$ | ¹¹ UEHARA 10A BELL 10.6 $e^+e^- \rightarrow e^+e^-\eta\eta$ |

¹¹ 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 $\pi^-p \rightarrow \pi^0\pi^0n$ |
| $0.21^{+0.02}_{-0.03}$ | ¹² LONGACRE 86 RVUE Compilation |
| 0.44 ± 0.03 | ¹³ CASON 82 STRC 8 $\pi^+p \rightarrow \Delta^{++}\pi^0$ |

¹² From a partial-wave analysis of data using a K-matrix formalism with 5 poles. Includes compilation of several other experiments.

¹³ Included in LONGACRE 86 global analysis.

| $\Gamma(\eta\eta)/\Gamma_{\text{total}}$ | Γ_2/Γ |
|---|---|
| VALUE | DOCUMENT ID TECN COMMENT |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | |
| $0.008^{+0.028}_{-0.003}$ | ¹⁴ LONGACRE 86 RVUE Compilation |

¹⁴ 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

| VALUE | DOCUMENT ID | TECN | COMMENT |
|-----------|-------------|------|---|
| 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 |
|---|------------------------|------|---|
| 0.003 ^{+0.019} _{-0.002} | ¹⁵ LONGACRE | 86 | RVUE Compilation |
| seen | COSTA... | 80 | OMEG 10 $\pi^- p \rightarrow K^+ K^- n$ |

¹⁵ 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

| | | | | |
|------------|-----|---------------|--------------------------------------|---------------------------|
| 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) |
| 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+) |
| CASON | 82 | PRL 48 1316 | N.M. Cason <i>et al.</i> | (NDAM, ANL) |
| COSTA... | 80 | NP B175 402 | G. Costa de Beauregard <i>et al.</i> | (BARI, BONN+) |