# $f_2(2340)$

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

## $f_2(2340)$ MASS

| *VALUE* (MeV) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| **$2346^{+21}_{-10}$ OUR AVERAGE** | | | | | |
| $2346 \pm 8^{+22}_{-6}$ | | [1] ABLIKIM | 22C | BES3 | $J/\psi \to \gamma\eta'\eta' \to 4/5\gamma 2(\pi^+\pi^-)$ |
| $2362^{+31+140}_{-30-63}$ | 5.5k | [2] ABLIKIM | 13N | BES3 | $e^+e^- \to J/\psi \to \gamma\eta\eta$ |
| $2339 \pm 55$ | | [3] ETKIN | 88 | MPS | $22\ \pi^- p \to \phi\phi n$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $2350 \pm 7$ | 80k | [4] UMAN | 06 | E835 | $5.2\ \overline{p}p \to \eta\eta\pi^0$ |
| $2392 \pm 10$ | | BOOTH | 86 | OMEG | $85\ \pi^-$ Be $\to 2\phi$Be |
| $2360 \pm 20$ | | LINDENBAUM | 84 | RVUE | |

[1] From a partial wave analysis of the systems $(\gamma X)$, with $X \to \eta'\eta'$, and $(\eta' X)$, with $X \to \gamma\eta'$ in the decay $J/\psi \to \gamma\eta'\eta'$. The intermediate resonance $X$ is parametrized by a constant-width, relativistic Breit-Wigner.

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

[3] Includes data of ETKIN 85. The percentage of the resonance going into $\phi\phi\ 2^{++}\ S_2$, $D_2$, and $D_0$ is $37 \pm 19$, $4^{+12}_{-4}$, and $59^{+21}_{-19}$, respectively.

[4] Statistical error only.

## $f_2(2340)$ WIDTH

| *VALUE* (MeV) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| **$331^{+27}_{-18}$ OUR AVERAGE** | | | | | |
| $332 \pm 14^{+26}_{-12}$ | | [1] ABLIKIM | 22C | BES3 | $J/\psi \to \gamma\eta'\eta' \to 4/5\gamma 2(\pi^+\pi^-)$ |
| $334^{+62+165}_{-54-100}$ | 5.5k | [2] ABLIKIM | 13N | BES3 | $e^+e^- \to J/\psi \to \gamma\eta\eta$ |
| $319^{+81}_{-69}$ | | [3] ETKIN | 88 | MPS | $22\ \pi^- p \to \phi\phi n$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $218 \pm 16$ | 80k | [4] UMAN | 06 | E835 | $5.2\ \overline{p}p \to \eta\eta\pi^0$ |
| $198 \pm 50$ | | BOOTH | 86 | OMEG | $85\ \pi^-$ Be $\to 2\phi$Be |
| $150^{+150}_{-50}$ | | LINDENBAUM | 84 | RVUE | |

[1] From a partial wave analysis of the systems $(\gamma X)$, with $X \to \eta'\eta'$, and $(\eta' X)$, with $X \to \gamma\eta'$ in the decay $J/\psi \to \gamma\eta'\eta'$. The intermediate resonance $X$ is parametrized by a constant-width, relativistic Breit-Wigner.

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

[3] Includes data of ETKIN 85.

[4] Statistical error only.

## $f_2(2340)$ DECAY MODES

| | Mode | Fraction ($\Gamma_i/\Gamma$) |
|---|---|---|
| $\Gamma_1$ | $\phi\phi$ | seen |
| $\Gamma_2$ | $\eta\eta$ | seen |
| $\Gamma_3$ | $\eta'\eta'$ | seen |

## $f_2(2340)$ BRANCHING RATIOS

### $\Gamma(\eta\eta)/\Gamma_{\text{total}}$ $\Gamma_2/\Gamma$

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **seen** | UMAN | 06 | E835 | $5.2\ \overline{p}p \rightarrow\ \eta\eta\pi^0$ |

### $\Gamma(\eta'\eta')/\Gamma_{\text{total}}$ $\Gamma_3/\Gamma$

| VALUE | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|
| **seen** | [1] ABLIKIM | 22C | BES3 | $J/\psi \rightarrow\ \gamma\eta'\eta' \rightarrow\ 4/5\gamma 2(\pi^+\pi^-)$ |

[1] From a partial wave analysis of the systems $(\gamma X)$, with $X \rightarrow\ \eta'\eta'$, and $(\eta' X)$, with $X \rightarrow\ \gamma\eta'$ in the decay $J/\psi \rightarrow\ \gamma\eta'\eta'$. The intermediate resonance $X$ is parametrized by a constant-width, relativistic Breit-Wigner.

## $f_2(2340)$ REFERENCES


| | | | | |
|---|---|---|---|---|
| ABLIKIM | 22C | PR D105 072002 | M. Ablikim *et al.* | (BESIII Collab.) |
| ABLIKIM | 13N | PR D87 092009 | M. Ablikim *et al.* | (BESIII Collab.) |
| UMAN | 06 | PR D73 052009 | I. Uman *et al.* | (FNAL E835) |
| ETKIN | 88 | PL B201 568 | A. Etkin *et al.* | (BNL, CUNY) |
| BOOTH | 86 | NP B273 677 | P.S.L. Booth *et al.* | (LIVP, GLAS, CERN) |
| ETKIN | 85 | PL 165B 217 | A. Etkin *et al.* | (BNL, CUNY) |
| LINDENBAUM | 84 | CNPP 13 285 | S.J. Lindenbaum | (CUNY) |