**$f_2(1950)$**

\[ f_2^G(J^{PC}) = 0^+(2^{++}) \]

### $f_2(1950)$ MASS

<table>
<thead>
<tr>
<th>VALUE (MeV)</th>
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<th>COMMENT</th>
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<tbody>
<tr>
<td>1944±12 OUR AVERAGE</td>
<td>05 GAMS</td>
<td>BINON 01</td>
<td>Error includes scale factor of 1.5. See the ideogram below.</td>
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<tr>
<td>1940±50</td>
<td>00J SPEC</td>
<td>ANISOVICH</td>
<td></td>
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<tr>
<td>1980±22</td>
<td>00C</td>
<td>BARBERIS</td>
<td></td>
</tr>
<tr>
<td>1940±22</td>
<td>00C</td>
<td>BARBERIS</td>
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<tr>
<td>1980±50</td>
<td>99B SPEC</td>
<td>ANISOVICH</td>
<td></td>
</tr>
<tr>
<td>1960±30</td>
<td>97B OMEG</td>
<td>BARBERIS</td>
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</tr>
<tr>
<td>1918±12</td>
<td>95 OMEG</td>
<td>ANTONIORI</td>
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</table>

1. First solution, PWA is ambiguous.
2. Decaying into $\pi^+\pi^- 2\pi^0$.
3. Decaying into $2(\pi^+\pi^-)$.
4. Taking into account $f_2^G(2050)$.
5. $T$-matrix pole.
6. From solution B of amplitude analysis of data on $\pi\pi \rightarrow \pi\pi$. See however KLOET 96 who fit $\pi^+\pi^-$ only and find waves only up to $J = 3$ to be important but not significantly resonant.
7. Cannot determine spin to be 2.

---

**WEIGHTED AVERAGE**

1944±12 (Error scaled by 1.5)

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**$f_2(1950)$ WIDTH**

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<th>COMMENT</th>
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<tbody>
<tr>
<td>472±18 OUR AVERAGE</td>
<td>05 GAMS</td>
<td>BINON 01</td>
<td>33 $\pi^-\rho \rightarrow \eta\eta\pi$</td>
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<tr>
<td>495±50</td>
<td>00J SPEC</td>
<td>ANISOVICH</td>
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<tr>
<td>380±120</td>
<td>00A BES</td>
<td>BAI</td>
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<tr>
<td>520±50</td>
<td>00C</td>
<td>BARBERIS</td>
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</tbody>
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**NODE=M135M;LINKAGE=BI**

**NODE=M135M;LINKAGE=BB**

**NODE=M135M;LINKAGE=UE**

---

**$f_2(1950)$ MASS**

---

**$f_2(1950)$ WIDTH**

---

**NODE=M135W**

---

**NODE=M135W**
8 First solution, PW A is ambiguous. NODE=M135W; LINKAGE=BI

9 Decaying into $\pi^+\pi^- - 2\pi^0$.

10 Decaying into $2(\pi^+\pi^-)$.

11 Taking into account $f_4(2050)$.

12 $T$-matrix pole.

13 From solution B of amplitude analysis of data on $pp \rightarrow \pi\pi$. See however KLOET 96 who fit $\pi^+\pi^-$ only and find waves only up to $J = 3$ to be important but not significantly resonant.

14 Cannot determine spin to be 2.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Fraction ($\Gamma_i/\Gamma$)</th>
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<tbody>
<tr>
<td>$K^+(892)K^+(892)$</td>
<td>seen</td>
</tr>
<tr>
<td>$\pi\pi$</td>
<td>seen</td>
</tr>
<tr>
<td>$\eta\eta$</td>
<td>seen</td>
</tr>
<tr>
<td>$KK$</td>
<td>seen</td>
</tr>
<tr>
<td>$\gamma\gamma$</td>
<td>seen</td>
</tr>
<tr>
<td>$pp$</td>
<td>seen</td>
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</tbody>
</table>

### $f_2(1950)$ DECAY MODES

<table>
<thead>
<tr>
<th>Mode</th>
<th>Value ($\Gamma_i/\Gamma$)</th>
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<tbody>
<tr>
<td>$\gamma(\eta\eta)/\Gamma_{\text{total}}$</td>
<td>$\Gamma_10\Gamma_11/\Gamma_{\text{total}}$</td>
</tr>
<tr>
<td>$\Gamma(\eta\eta)/\Gamma_{\text{total}}$</td>
<td>$\Gamma_{\text{211}}/\Gamma_{\text{11}}$</td>
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</table>

<table>
<thead>
<tr>
<th>Value (eV)</th>
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<th>TECN</th>
<th>COMMENT</th>
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</thead>
<tbody>
<tr>
<td>122±4±26</td>
<td>15 ABE</td>
<td>04 BELL</td>
<td>10.6 $e^+e^- \rightarrow e^+e^- K^+K^-$</td>
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</tbody>
</table>

Assuming spin 2.

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<th>Value (eV)</th>
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<th>TECN</th>
<th>COMMENT</th>
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</thead>
<tbody>
<tr>
<td>162±69±1137</td>
<td>16 UEHARA</td>
<td>09 BELL</td>
<td>10.6 $e^+e^- \rightarrow e^+e^- \pi^0\pi^0$</td>
<td></td>
</tr>
</tbody>
</table>

Taking into account $f_4(2050)$.

### $f_2(1950)$ BRANCHING RATIOS

<table>
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<th>Mode</th>
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<th>CHG</th>
<th>COMMENT</th>
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<tbody>
<tr>
<td>$\Gamma(K^+K^-)/\Gamma_{\text{total}}$</td>
<td>$\Gamma_1/\Gamma_{\text{11}}$</td>
<td>$\Gamma_1/\Gamma$</td>
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</tr>
<tr>
<td>$\Gamma(K^+(892)K^+(892))/\Gamma_{\text{total}}$</td>
<td>$\Gamma_1/\Gamma_{\text{11}}$</td>
<td>$\Gamma_1/\Gamma$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Gamma(a_2(1320)\pi)/\Gamma_{\text{total}}$</td>
<td>$\Gamma_7/\Gamma$</td>
<td>$\Gamma_7/\Gamma$</td>
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We do not use the following data for averages, fits, limits, etc.
\[ \frac{\Gamma(\eta\eta)}{\Gamma(4\pi)} \]  

\[ \frac{\Gamma_9}{\Gamma_5} \]  

\[ \frac{\Gamma(\eta\eta)}{\Gamma(\pi^+\pi^-)} \]  

\[ \frac{\Gamma_9}{\Gamma_3} \]  

\[ \frac{\Gamma(pp)/\Gamma_{\text{total}}}{\Gamma_{12}/\Gamma} \]  

\[ \delta_2(1950) \text{ REFERENCES} \]  

<table>
<thead>
<tr>
<th>VALUE ( \times 10^{-3} )</th>
<th>DOCUMENT ID</th>
<th>TECN</th>
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<th>NODE = M135R5</th>
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<tbody>
<tr>
<td>(&lt;5.0 \times 10^{-3}) | BARBERIS 00E | 450 (pp \rightarrow \eta\eta p_p) | NODE = M135R5</td>
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\[ \frac{\Gamma(\eta\eta)}{\Gamma(\pi^+\pi^-)} \]  

\[ \frac{\Gamma_9}{\Gamma_3} \]  

\[ \frac{\Gamma(pp)/\Gamma_{\text{total}}}{\Gamma_{12}/\Gamma} \]  

\[ \delta_2(1950) \text{ REFERENCES} \]  

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<th>NODE = M135R6</th>
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<tr>
<td>(0.14 \pm 0.05) | AMSLER 02 | CBAR | 0.9 (p\eta \rightarrow \pi^0\eta\eta, \pi^0\eta\eta) | NODE = M135R6</td>
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\[ \frac{\Gamma(pp)/\Gamma_{\text{total}}}{\Gamma_{12}/\Gamma} \]  

\[ \delta_2(1950) \text{ REFERENCES} \]  

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<th>NODE = M135R7</th>
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<tr>
<td>(\text{seen}) | ALEXANDER 10 | CLEO | (\psi(2S) \rightarrow \gamma p\bar{p}) | NODE = M135R7</td>
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\[ \delta_2(1950) \text{ REFERENCES} \]  

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