\[ \pi(1800) \]

\[ I^G(J^{PC}) = 1^-(0^+) \]

See also minireview under non-\( q\bar{q} \) candidates in PDG 06, Journal of Physics G33 1 (2006).

\[ \pi(1800) \text{ mass (MeV)} \]

<table>
<thead>
<tr>
<th>VALUE (MeV)</th>
<th>EVTS</th>
<th>DOCUMENT ID</th>
<th>TECN</th>
<th>CHG</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1812 ± 12</td>
<td>OUR AVERAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1785 ± 9 ± 12/6</td>
<td>420k</td>
<td>ALEKSEEV 10</td>
<td>COMP</td>
<td>190 ( \pi^- P_b \rightarrow \pi^- \pi^+ P_b' )</td>
<td></td>
</tr>
<tr>
<td>1876 ± 18 ± 16</td>
<td>4k</td>
<td>EUGENIO 08</td>
<td>B852</td>
<td>-</td>
<td>( 18 \pi^- p \rightarrow \eta \pi^- p )</td>
</tr>
<tr>
<td>1774 ± 18 ± 20</td>
<td>2</td>
<td>CHUNG 02</td>
<td>B852</td>
<td>18.3 ( \pi^- A \rightarrow \pi^+ \pi^- \pi^- A )</td>
<td></td>
</tr>
<tr>
<td>1863 ± 9 ± 10</td>
<td>3</td>
<td>CHUNG 02</td>
<td>B852</td>
<td>-</td>
<td>( 18.3 \pi^- p \rightarrow \pi^+ \pi^- \pi^- p )</td>
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<tr>
<td>1840 ± 10 ± 10</td>
<td>1200</td>
<td>AMELIN 96B</td>
<td>VES</td>
<td>-</td>
<td>( 37 \pi^- A \rightarrow \eta \pi^- A )</td>
</tr>
<tr>
<td>1775 ± 7 ± 10</td>
<td>4</td>
<td>AMELIN 95B</td>
<td>VES</td>
<td>-</td>
<td>( 36 \pi^- A \rightarrow \pi^+ \pi^- \pi^- A )</td>
</tr>
<tr>
<td>1790 ± 14</td>
<td>5</td>
<td>BERDNIKOV 94</td>
<td>VES</td>
<td>-</td>
<td>( 37 \pi^- A \rightarrow K^+ K^- \pi^- A )</td>
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<tr>
<td>1873 ± 33 ± 20</td>
<td>92c</td>
<td>BELADIDZE</td>
<td>VES</td>
<td>-</td>
<td>( 36 \pi^- Be \rightarrow \pi^- \eta' \eta Be )</td>
</tr>
<tr>
<td>1814 ± 10 ± 23</td>
<td>426 ± 57</td>
<td>BITYUKOV 91</td>
<td>VES</td>
<td>-</td>
<td>( 36 \pi^- C \rightarrow \pi^- \eta \eta C )</td>
</tr>
<tr>
<td>1770 ± 30</td>
<td>1100</td>
<td>BELLINI 82</td>
<td>SPEC</td>
<td>-</td>
<td>( 40 \pi^- A \rightarrow 3 \pi A )</td>
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<tr>
<td>1737 ± 5 ± 15</td>
<td>AMELIN 99</td>
<td>VES</td>
<td>-</td>
<td>( 37 \pi^- A \rightarrow \omega \pi^- \pi^0 A^* )</td>
<td></td>
</tr>
</tbody>
</table>

- We do not use the following data for averages, fits, limits, etc.

\( \chi^2 \)

1812 ± 12 (Error scaled by 2.3)

\[ \chi^2 \text{ (Confidence Level < 0.0001)} \]

\[ \pi(1800) \text{ mass (MeV)} \]

HTTP://PDG.LBL.GOV Page 1 Created: 5/30/2017 17:21
1. From a single-pole fit.
2. In the $f_0(980)\pi$ wave.
3. In the $f_0(500)\pi$ wave.
4. From a fit to $J^{PC} = 0^{- +} f_0(980)\pi$, $f_0(1370)\pi$ waves.
5. From a fit to $J^{PC} = 0^{- +} K^*_0(1430)K^-$ and $f_0(980)\pi^-$ waves.

### $\pi(1800)$ WIDTH

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<thead>
<tr>
<th>VALUE (MeV)</th>
<th>EVTS</th>
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<th>TECN</th>
<th>CHG</th>
<th>COMMENT</th>
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</thead>
<tbody>
<tr>
<td>208 ± 12</td>
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<td>OUR AVERAGE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>208 ± 22 + 21/−37</td>
<td>420k</td>
<td>ALEKSEEV 10</td>
<td>COMP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>221 ± 26 ± 38</td>
<td>4k</td>
<td>6 EUGENIO 08</td>
<td>B852</td>
<td>–</td>
<td></td>
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<tr>
<td>223 ± 48 ± 50</td>
<td>7</td>
<td>CHUNG 02</td>
<td>B852</td>
<td>18</td>
<td>$\pi^+ \pi^- \rightarrow$</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37</td>
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</tr>
<tr>
<td>191 ± 21 ± 20</td>
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<td>CHUNG 02</td>
<td>B852</td>
<td>18</td>
<td>$\pi^+ \pi^- \rightarrow$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>36</td>
<td>$\pi^- A \rightarrow \pi^+ \pi^- \pi^- A$</td>
</tr>
<tr>
<td>210 ± 30 ± 30</td>
<td>1200</td>
<td>AMELIN 96b</td>
<td>VES</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>190 ± 15 ± 15</td>
<td>9</td>
<td>AMELIN 95b</td>
<td>VES</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>210 ± 70</td>
<td>10</td>
<td>BERDNIKOV 94</td>
<td>VES</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>225 ± 35 ± 20</td>
<td>92c</td>
<td>BELADIDZE 92</td>
<td>VES</td>
<td>–</td>
<td></td>
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<tr>
<td>205 ± 18 ± 32</td>
<td>426 ± 57</td>
<td>BITYUKOV 91</td>
<td>VES</td>
<td>–</td>
<td></td>
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<tr>
<td>310 ± 50</td>
<td>82</td>
<td>BELLINI 82</td>
<td>SPEC</td>
<td>–</td>
<td></td>
</tr>
</tbody>
</table>

- - - We do not use the following data for averages, fits, limits, etc. - - -

<table>
<thead>
<tr>
<th>VALUE (MeV)</th>
<th>EVTS</th>
<th>DOCUMENT ID</th>
<th>TECN</th>
<th>CHG</th>
<th>COMMENT</th>
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</thead>
<tbody>
<tr>
<td>259 ± 19 ± 6</td>
<td>99</td>
<td>AMELIN 99</td>
<td>VES</td>
<td>–</td>
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</tbody>
</table>

- From a single-pole fit.
- In the $f_0(980)\pi$ wave.
- In the $f_0(500)\pi$ wave.
- From a fit to $J^{PC} = 0^{- +} f_0(980)\pi$, $f_0(1370)\pi$ waves.
- From a fit to $J^{PC} = 0^{- +} K^*_0(1430)K^-$ and $f_0(980)\pi^-$ waves.

### $\pi(1800)$ DECAY MODES

<table>
<thead>
<tr>
<th>Mode</th>
<th>Fraction ($\Gamma_i/\Gamma$)</th>
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</thead>
<tbody>
<tr>
<td>$\Gamma_1$</td>
<td>$\pi^+ \pi^- \pi^-$</td>
</tr>
<tr>
<td>$\Gamma_2$</td>
<td>$f_0(500)\pi^-$</td>
</tr>
<tr>
<td>$\Gamma_3$</td>
<td>$f_0(980)\pi^-$</td>
</tr>
<tr>
<td>$\Gamma_4$</td>
<td>$f_0(1370)\pi^-$</td>
</tr>
<tr>
<td>$\Gamma_5$</td>
<td>$a_0(980)\eta$</td>
</tr>
<tr>
<td>$\Gamma_6$</td>
<td>$a_2(1320)\eta$</td>
</tr>
<tr>
<td>$\Gamma_7$</td>
<td>$\eta\eta\pi^-$</td>
</tr>
<tr>
<td>$\Gamma_8$</td>
<td>not seen</td>
</tr>
<tr>
<td>$\Gamma_9$</td>
<td>not seen</td>
</tr>
</tbody>
</table>

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\( \frac{\Gamma(f_0(980)\pi^-)}{\Gamma(f_0(500)\pi^-)} = \frac{\Gamma_3}{\Gamma_2} \)

<table>
<thead>
<tr>
<th>VALUE</th>
<th>DOCUMENT ID</th>
<th>TECN</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0.44\pm0.08\pm0.38)</td>
<td>11 CHUNG 02 B852</td>
<td>18.3 (\pi^-\ p \rightarrow \pi^+\pi^-\pi^-\ p)</td>
<td></td>
</tr>
</tbody>
</table>

\( \frac{\Gamma(f_0(980)\pi^-)}{\Gamma(f_0(1370)\pi^-)} = \frac{\Gamma_3}{\Gamma_4} \)

<table>
<thead>
<tr>
<th>VALUE</th>
<th>DOCUMENT ID</th>
<th>TECN</th>
<th>CHG</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1.7\pm1.3)</td>
<td>12 AMELIN 95b VES</td>
<td>-</td>
<td>36 (\pi^-\ A \rightarrow \pi^+\pi^-\pi^-\ A)</td>
<td></td>
</tr>
</tbody>
</table>

\( \frac{\Gamma(f_0(1370)\pi^-)}{\Gamma_{\text{total}}} = \frac{\Gamma_4}{\Gamma} \)

<table>
<thead>
<tr>
<th>VALUE</th>
<th>DOCUMENT ID</th>
<th>TECN</th>
<th>CHG</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>seen</td>
<td>BELLINI 82 SPEC</td>
<td>-</td>
<td>40 (\pi^-\ A \rightarrow 3\pi A)</td>
<td></td>
</tr>
</tbody>
</table>

\( \frac{\Gamma(f_0(1500)\pi^-)}{\Gamma_{\text{total}}} = \frac{\Gamma_5}{\Gamma} \)

<table>
<thead>
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<th>VALUE</th>
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<th>COMMENT</th>
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</thead>
<tbody>
<tr>
<td>not seen</td>
<td>CHUNG 02 B852</td>
<td>18.3 (\pi^-\ p \rightarrow \pi^+\pi^-\pi^-\ p)</td>
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</tr>
</tbody>
</table>

\( \frac{\Gamma(\rho\pi^-)}{\Gamma_{\text{total}}} = \frac{\Gamma_6}{\Gamma} \)

<table>
<thead>
<tr>
<th>VALUE</th>
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<th>TECN</th>
<th>CHG</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>not seen</td>
<td>BELLINI 82 SPEC</td>
<td>-</td>
<td>40 (\pi^-\ A \rightarrow 3\pi A)</td>
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</tbody>
</table>

\( \frac{\Gamma(\rho\pi^-)}{\Gamma(f_0(980)\pi^-)} = \frac{\Gamma_6}{\Gamma_3} \)

<table>
<thead>
<tr>
<th>VALUE</th>
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<th>CHG</th>
<th>COMMENT</th>
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</thead>
<tbody>
<tr>
<td>(&lt;0.25)</td>
<td>CHUNG 02 B852</td>
<td>18.3 (\pi^-\ p \rightarrow \pi^+\pi^-\pi^-\ p)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(&lt;0.14)</td>
<td>90 AMELIN 95b VES</td>
<td>-</td>
<td>36 (\pi^-\ A \rightarrow \pi^+\pi^-\pi^-\ A)</td>
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\( \frac{\Gamma(\eta\pi^-)}{\Gamma(\pi^+\pi^-\pi^-)} = \frac{\Gamma_7}{\Gamma_1} \)

<table>
<thead>
<tr>
<th>VALUE</th>
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<th>TECN</th>
<th>CHG</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0.5\pm0.1)</td>
<td>1200</td>
<td>12 AMELIN 96b VES</td>
<td>-</td>
<td>37 (\pi^-\ A \rightarrow \eta\pi^-\pi^-\ A)</td>
<td></td>
</tr>
</tbody>
</table>

\( \frac{\Gamma(a_2(1320)\eta)}{\Gamma_{\text{total}}} = \frac{\Gamma_9}{\Gamma} \)

<table>
<thead>
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<th>VALUE</th>
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<th>TECN</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>not seen</td>
<td>EUGENIO 08 B852</td>
<td>18 (\pi^-\ p \rightarrow \eta\pi^-\pi^-\ p)</td>
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</table>

\( \frac{\Gamma(f_2(1270)\pi)}{\Gamma_{\text{total}}} = \frac{\Gamma_{10}}{\Gamma} \)

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<th>COMMENT</th>
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<tbody>
<tr>
<td>not seen</td>
<td>EUGENIO 08 B852</td>
<td>18 (\pi^-\ p \rightarrow \eta\pi^-\pi^-\ p)</td>
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</tbody>
</table>
\[ \frac{\Gamma(f_0(1370)\pi^-)}{\Gamma_{\text{total}}} \]

<table>
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<tr>
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<th>COMMENT</th>
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<tbody>
<tr>
<td>not seen</td>
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</tbody>
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\[ \frac{\Gamma(f_0(1500)\pi^-)}{\Gamma(a_0(980)\eta)} \]

<table>
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<tr>
<th>VALUE</th>
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<th>CHG</th>
<th>COMMENT</th>
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</thead>
<tbody>
<tr>
<td>0.48 ± 0.17</td>
<td>4k</td>
<td>12,13 EUGENIO</td>
<td>08</td>
<td>B852</td>
<td>(\pi^- p \rightarrow \eta \pi^- p)</td>
</tr>
<tr>
<td>0.030 ± 0.014</td>
<td>−0.011</td>
<td>12 ANISOVICH</td>
<td>01B</td>
<td>SPEC</td>
<td>0</td>
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<tr>
<td>0.08 ± 0.03</td>
<td>1200</td>
<td>12,14 AMELIN</td>
<td>96B</td>
<td>VES</td>
<td>(37 \pi^- A \rightarrow \eta \pi^- A)</td>
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</table>

\[ \frac{\Gamma(\eta\eta'(958)\pi^-)}{\Gamma(\eta\eta\pi^-)} \]

<table>
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<tr>
<td>0.29±0.07</td>
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<td>12 BELADIDZE</td>
<td>92C</td>
<td>VES</td>
<td>(36 \pi^- Be \rightarrow \pi^- \eta' \eta Be)</td>
</tr>
<tr>
<td>0.3 ± 0.1</td>
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<td>12 BITYUKOV</td>
<td>91</td>
<td>VES</td>
<td>(36 \pi^- C \rightarrow \pi^- \eta \eta C)</td>
</tr>
</tbody>
</table>

\[ \frac{\Gamma(K_0^*(1430)K^-)}{\Gamma_{\text{total}}} \]

<table>
<thead>
<tr>
<th>VALUE</th>
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</thead>
<tbody>
<tr>
<td>seen</td>
<td>BERDNIKOV</td>
<td>94</td>
<td>VES</td>
<td>(37 \pi^- A \rightarrow K^+ K^- \pi^- A)</td>
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</table>

\[ \frac{\Gamma(K^*(892)K^0)}{\Gamma_{\text{total}}} \]

<table>
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<tbody>
<tr>
<td>not seen</td>
<td>BERDNIKOV</td>
<td>94</td>
<td>VES</td>
<td>(37 \pi^- A \rightarrow K^+ K^- \pi^- A)</td>
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</table>

11 Assuming that \(f_0(980)\) decays only to \(\pi \pi\).
12 Systematic errors not estimated.
13 From a single-pole fit.
14 Assuming that \(f_0(1500)\) decays only to \(\eta \eta\) and \(a_0(980)\) decays only to \(\eta \pi\).

### References

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