\( K^*(1680) \)

\[ I(J^P) = \frac{1}{2}(1^-) \]

**\( K^*(1680) \) Mass**

<table>
<thead>
<tr>
<th>Value (MeV)</th>
<th>Document ID</th>
<th>TECN</th>
<th>CHG</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1717 ± 27</td>
<td>OUR AVERAGE</td>
<td>Error includes scale factor of 1.4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1677 ± 10 ± 32</td>
<td>ASTON 88</td>
<td>LASS 0</td>
<td>11</td>
<td>( K^- p \to K^- \pi^+ n )</td>
</tr>
<tr>
<td>1735 ± 10 ± 20</td>
<td>ASTON 87</td>
<td>LASS 0</td>
<td>11</td>
<td>( K^- p \to K^0 \pi^+ \pi^- n )</td>
</tr>
<tr>
<td>~1678 ± 64</td>
<td>BIRD 89</td>
<td>LASS –</td>
<td>11</td>
<td>( K^- p \to K^0 \pi^- p )</td>
</tr>
<tr>
<td>1800 ± 70</td>
<td>ETKIN 80</td>
<td>MPS 0</td>
<td>6</td>
<td>( K^- p \to K^0 \pi^+ \pi^- n )</td>
</tr>
</tbody>
</table>

**\( K^*(1680) \) Width**

<table>
<thead>
<tr>
<th>Value (MeV)</th>
<th>Document ID</th>
<th>TECN</th>
<th>CHG</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>322 ± 110</td>
<td>OUR AVERAGE</td>
<td>Error includes scale factor of 4.2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>205 ± 16 ± 34</td>
<td>ASTON 88</td>
<td>LASS 0</td>
<td>11</td>
<td>( K^- p \to K^- \pi^+ n )</td>
</tr>
<tr>
<td>423 ± 18 ± 30</td>
<td>ASTON 87</td>
<td>LASS 0</td>
<td>11</td>
<td>( K^- p \to K^0 \pi^+ \pi^- n )</td>
</tr>
<tr>
<td>454 ± 270</td>
<td>BIRD 89</td>
<td>LASS –</td>
<td>11</td>
<td>( K^- p \to K^0 \pi^- p )</td>
</tr>
<tr>
<td>170 ± 30</td>
<td>ETKIN 80</td>
<td>MPS 0</td>
<td>6</td>
<td>( K^- p \to K^0 \pi^+ \pi^- n )</td>
</tr>
<tr>
<td>250 to 300</td>
<td>ESTABROOKS 78</td>
<td>ASPK 0</td>
<td>13</td>
<td>( K^\pm p \to K^\pm \pi^\pm n )</td>
</tr>
</tbody>
</table>

**\( K^*(1680) \) Decay Modes**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Fraction (( \Gamma_i/\Gamma ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \Gamma_1 )</td>
<td>( K\pi )</td>
</tr>
<tr>
<td>( \Gamma_2 )</td>
<td>( K\rho )</td>
</tr>
<tr>
<td>( \Gamma_3 )</td>
<td>( K^*(892)\pi )</td>
</tr>
</tbody>
</table>

**Constrained Fit Information**
An overall fit to 4 branching ratios uses 4 measurements and one constraint to determine 3 parameters. The overall fit has a $\chi^2 = 2.9$ for 2 degrees of freedom.

The following off-diagonal array elements are the correlation coefficients $\langle \delta x_i \delta x_j \rangle / \langle \delta x_i^2 \rangle$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$. The fit constrains the $x_i$ whose labels appear in this array to sum to one.

\[
\begin{array}{ccc}
\chi_2 & -36 \\
\chi_3 & -39 & -72 \\
\chi_1 & \chi_2 \\
\end{array}
\]

### K*(1680) BRANCHING RATIOS

<table>
<thead>
<tr>
<th>$\Gamma(K\pi)/\Gamma_{\text{total}}$</th>
<th>$\Gamma_1/\Gamma_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VALUE</strong></td>
<td><strong>DOCUMENT ID</strong></td>
</tr>
<tr>
<td>0.387±0.026 OUR FIT</td>
<td>ASTON 88 LASS 0</td>
</tr>
<tr>
<td>0.388±0.014±0.022</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$\Gamma_1/\Gamma_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VALUE</strong></td>
</tr>
<tr>
<td>1.30±0.23 OUR FIT</td>
</tr>
<tr>
<td>2.8 ±1.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$\Gamma_2/\Gamma_1$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VALUE</strong></td>
</tr>
<tr>
<td>0.81±0.14 OUR FIT</td>
</tr>
<tr>
<td>1.2 ±0.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$\Gamma_2/\Gamma_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VALUE</strong></td>
</tr>
<tr>
<td>1.05±0.27 OUR FIT</td>
</tr>
<tr>
<td>0.97±0.09±0.30 OUR FIT</td>
</tr>
</tbody>
</table>

### K*(1680) REFERENCES

| BIRD 89 | SLAC-332 | P.F. Bird (SLAC) |
| ASTON 88 | NP B296 493 | D. Aston et al. (SLAC, NAGO, CINC, INUS) |
| ASTON 87 | NP B292 693 | D. Aston et al. (SLAC, NAGO, CINC, INUS) |
| ASTON 84 | PL 149B 258 | D. Aston et al. (SLAC, CARL, OTTA) JP |
| ETKIN 80 | PR D22 42 | A. Etkin et al. (BNL, CUNY) JP |
| ESTABROOKS 78 | NP B133 490 | P.G. Estabrooks et al. (MCGI, CARL, DURH+) JP |

### OTHER RELATED PAPERS

| ABLIKIM 05Q | PR D72 092002 | M. Ablikim et al. (BES Collab.) |
| EBERT 05 | MPL A20 1887 | D. Ebert, R.N. Faustov, V.O. Galkin |
| LI 05E | MPL A20 2497 | D.-M. Li et al. |

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