\( X(4140) \)

\[ J^G(J^P C) = 0^+(?^+?) \]

OMITTED FROM SUMMARY TABLE

Needs confirmation.

Seen by AALTONEN 09AH and ABAZOV 14A in the \( B^+ \rightarrow X K^+ \), \( X \rightarrow J/\psi \phi \). Not seen by SHEN 10 in \( \gamma \gamma \rightarrow J/\psi \phi \) or AAIJ 12AA in \( B^+ \rightarrow J/\psi \phi K^+ \).

### \( X(4140) \) MASS

<table>
<thead>
<tr>
<th>VALUE (MeV)</th>
<th>EVTS</th>
<th>DOCUMENT ID</th>
<th>TECN</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4159.0±4.3±6.6</td>
<td>52 ± 19</td>
<td>1 ABAZOV 14A D0</td>
<td>( B^+ \rightarrow J/\psi \phi K^+ )</td>
<td></td>
</tr>
<tr>
<td>4143.0±2.9±1.2</td>
<td>14 ± 5</td>
<td>2 AALTONEN 09AH CDF</td>
<td>( B^+ \rightarrow J/\psi \phi K^+ )</td>
<td></td>
</tr>
</tbody>
</table>

1 Statistical significance of 3.1 \( \sigma \).
2 Statistical significance of 3.8 \( \sigma \).

### \( X(4140) \) WIDTH

<table>
<thead>
<tr>
<th>VALUE (MeV)</th>
<th>EVTS</th>
<th>DOCUMENT ID</th>
<th>TECN</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 ±13 ±3 ±8</td>
<td>52 ± 19</td>
<td>3 ABAZOV 14A D0</td>
<td>( B^+ \rightarrow J/\psi \phi K^+ )</td>
<td></td>
</tr>
<tr>
<td>11.7 +8.3 ±3.7</td>
<td>14 ± 5</td>
<td>4 AALTONEN 09AH CDF</td>
<td>( B^+ \rightarrow J/\psi \phi K^+ )</td>
<td></td>
</tr>
</tbody>
</table>

3 Statistical significance of 3.1 \( \sigma \).
4 Statistical significance of 3.8 \( \sigma \).

### \( X(4140) \) DECAY MODES

<table>
<thead>
<tr>
<th>Mode</th>
<th>Fraction (( \Gamma_i/\Gamma ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \Gamma_1 )</td>
<td>( J/\psi \phi ) not seen</td>
</tr>
<tr>
<td>( \Gamma_2 )</td>
<td>( \gamma \gamma ) not seen</td>
</tr>
</tbody>
</table>

### \( X(4140) \) \( \Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total}) \)

<table>
<thead>
<tr>
<th>VALUE (eV)</th>
<th>CL%</th>
<th>DOCUMENT ID</th>
<th>TECN</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;41</td>
<td>90</td>
<td>5 SHEN 10</td>
<td>BELL</td>
<td>10.6 e⁺e⁻ → e⁺e⁻ ( J/\psi \phi )</td>
</tr>
</tbody>
</table>

5 For \( J^P = 0^+ \).
6 For \( J^P = 2^+ \).
### $X(4140)$ BRANCHING RATIOS

<table>
<thead>
<tr>
<th>Value</th>
<th>EVTS</th>
<th>Document ID</th>
<th>TECN</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>not seen</td>
<td>7</td>
<td>AAIJ</td>
<td>LHCb</td>
<td>$p p \rightarrow B^+ X$ at 7 TeV</td>
</tr>
<tr>
<td>seen</td>
<td>52 ± 19</td>
<td>ABAZOV</td>
<td>D0</td>
<td>$B^+ \rightarrow J/\psi \phi K^+$</td>
</tr>
<tr>
<td>seen</td>
<td>14 ± 5</td>
<td>AALTONEN</td>
<td>CDF</td>
<td>$B^+ \rightarrow J/\psi \phi K^+$</td>
</tr>
</tbody>
</table>

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

Reported $B(B^+ \rightarrow X(4140) K^+ ) B(X(4140) \rightarrow J/\psi \phi ) / B(B^+ \rightarrow J/\psi \phi K^+ ) < 0.07$ at 90% CL.

ABAZOV 14A reports $B(B^+ \rightarrow X(4140) K^+ \rightarrow J/\psi \phi K^+ ) / B(B^+ \rightarrow J/\psi \phi K^+ ) = (19 \pm 7 \pm 4\%)$ with 3.1 $\sigma$ significance.

9 Statistical significance of 3.8 $\sigma$.

### $X(4140)$ REFERENCES

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<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>not seen</td>
<td>SHEN</td>
<td>BELL</td>
<td>10.6 $e^+ e^- \rightarrow e^+ e^- J/\psi \phi$</td>
</tr>
</tbody>
</table>

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

<table>
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<table>
<thead>
<tr>
<th>Author</th>
<th>Journal</th>
<th>Volume</th>
<th>Page</th>
<th>Comment</th>
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<tbody>
<tr>
<td>ABAZOV</td>
<td>PR D89</td>
<td>012004</td>
<td>V.M. Abazov et al. (D0 Collab.)</td>
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<tr>
<td>AAIJ</td>
<td>PR D85</td>
<td>091103</td>
<td>R. Aaij et al. (LHCb Collab.)</td>
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<tr>
<td>SHEN</td>
<td>PRL 104</td>
<td>112004</td>
<td>C.P. Shen et al. (BELLE Collab.)</td>
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<td>AALTONEN</td>
<td>PRL 102</td>
<td>242002</td>
<td>T. Aaltonen et al. (CDF Collab.)</td>
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