$B_J(5840)^0$  

\[ I(J^P) = \frac{1}{2}(?) \]
\[ I, J, P \] need confirmation.

OMITTED FROM SUMMARY TABLE
Quantum numbers shown are quark-model predictions.

$B_J(5840)^0$ MASS

OUR FIT uses $m_{B^+}$ and $m_{B_J(5840)^0} - m_{B^+}$ to determine $m_{B_J(5840)^0}$.

\[
\begin{array}{l|c|c}
\text{VALUE (MeV)} & \text{DOCUMENT ID} \\
\hline
5863 \pm 9 & \text{OUR FIT} \\
\end{array}
\]

\[
\begin{array}{l|c|c|c|c}
\text{VALUE (MeV)} & \text{EVTS} & \text{DOCUMENT ID} & \text{TECN} & \text{COMMENT} \\
\hline
584 \pm 5 & 12k & 1 & AAIJ & 15AB LHCb, pp at 7, 8 TeV \\
\hline
610 \pm 22 & 12k & 2 & AAIJ & 15AB LHCb, pp at 7, 8 TeV \\
\end{array}
\]

1 AAIJ 15AB reports $[m_{B_J^0} - m_{B^+}] - m_{\pi^-} = 444 \pm 5 \pm 7$ MeV which we adjust by the $\pi^-$ mass. The masses inside the square brackets were measured for each candidate event. The result assumes $P = (-1)^J$ and uses two relativistic Breit-Wigner functions in the fit for mass difference.

2 AAIJ 15AB reports $[m_{B_J^0} - m_{B^+}] - m_{\pi^-} = 471 \pm 22 \pm 7$ MeV which we adjust by the $\pi^-$ mass. The masses inside the square brackets were measured for each candidate event. The result assumes $P = (-1)^J$ and uses three relativistic Breit-Wigner functions in the fit for mass difference.

$B_J(5840)^0$ WIDTH

\[
\begin{array}{l|c|c|c|c}
\text{VALUE (MeV)} & \text{EVTS} & \text{DOCUMENT ID} & \text{TECN} & \text{COMMENT} \\
\hline
127 \pm 17 & 12k & 1 & AAIJ & 15AB LHCb, pp at 7, 8 TeV \\
\hline
107 \pm 20 & 12k & 2 & AAIJ & 15AB LHCb, pp at 7, 8 TeV \\
\hline
119 \pm 17 & 12k & 3 & AAIJ & 15AB LHCb, pp at 7, 8 TeV \\
\end{array}
\]

1 Assuming $P = (-1)^J$ and using two relativistic Breit-Wigner functions in the fit for mass difference.
2 Assuming \( P = (-1)^J \) and using three relativistic Breit-Wigner functions in the fit for mass difference.
3 Assuming \( P = -(−1)^J \) and using three relativistic Breit-Wigner functions in the fit for mass difference.

### \( B_J(5840)^0 \) DECAY MODES

<table>
<thead>
<tr>
<th>Mode</th>
<th>Fraction (( \Gamma_i/\Gamma ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \Gamma_1 )</td>
<td>( B^{*+} \pi^- ) seen</td>
</tr>
<tr>
<td>( \Gamma_2 )</td>
<td>( B^+ \pi^- ) possibly seen</td>
</tr>
</tbody>
</table>

### \( B_J(5840)^0 \) BRANCHING RATIOS

<table>
<thead>
<tr>
<th>( \Gamma(B^{*+} \pi^-)/\Gamma_{total} )</th>
<th>( \Gamma_1/\Gamma )</th>
</tr>
</thead>
<tbody>
<tr>
<td>seen</td>
<td>( \frac{\Gamma_1}{\Gamma_{total}} )</td>
</tr>
<tr>
<td>12k</td>
<td>AAIJ 15AB LHCb</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>( \Gamma(B^+ \pi^-)/\Gamma_{total} )</th>
<th>( \Gamma_2/\Gamma )</th>
</tr>
</thead>
<tbody>
<tr>
<td>possibly seen</td>
<td>( \frac{\Gamma_2}{\Gamma_{total}} )</td>
</tr>
<tr>
<td>1 A ( B \pi ) decay is forbidden from a ( P = -(−1)^J ) parent, whereas ( B^* \pi ) is allowed.</td>
<td></td>
</tr>
</tbody>
</table>

### \( B_J(5840)^0 \) REFERENCES

AAIJ 15AB JHEP 1504 024 R. Aaij et al. (LHCb Collab.)