

**$B_J(5840)^+$**  $I(J^P) = \frac{1}{2}(??)$  Status: \*\*  
 $I, J, P$  need confirmation.

OMITTED FROM SUMMARY TABLE

Quantum numbers shown are quark-model predictions.

 **$B_J(5840)^+$  MASS**OUR FIT uses  $m_{B^0}$  and  $m_{B_J(5840)^+} - m_{B^0}$  to determine  $m_{B_J(5840)^+}$ .VALUE (MeV)DOCUMENT ID**5851 ± 19 OUR FIT** **$m_{B_J(5840)^+} - m_{B^0}$** VALUE (MeV)EVTSDOCUMENT IDTECNCOMMENT**571 ± 19 OUR FIT****571 ± 13 ± 14**

7k

<sup>1</sup> AAIJ15AB LHCb  $pp$  at 7, 8 TeV

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

595 ± 26 ± 14

7k

<sup>2</sup> AAIJ15AB LHCb  $pp$  at 7, 8 TeV<sup>1</sup> AAIJ 15AB reports  $[m_{B_J^+} - m_{B^0}] - m_{\pi^+} = 431 \pm 13 \pm 14$  MeV which we adjust bythe  $\pi^+$  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.<sup>2</sup> AAIJ 15AB reports  $[m_{B_J^+} - m_{B^0}] - m_{\pi^+} = 455 \pm 26 \pm 14$  MeV which we adjust bythe  $\pi^+$  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. **$m_{B_J(5840)^+} - m_{B^{*0}}$** VALUE (MeV)EVTSDOCUMENT IDTECNCOMMENT

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

565 ± 15 ± 14

7k

<sup>3</sup> AAIJ15AB LHCb  $pp$  at 7, 8 TeV<sup>3</sup> AAIJ 15AB reports  $[m_{B_J^+} - m_{B^0}] - (m_{B^{*+}} - m_{B^+}) - m_{\pi^+} = 425 \pm 15 \pm 14$ MeV which we adjust by the  $\pi^+$  mass. The masses inside the square brackets were measured for each candidate event. The result assumes  $P = -(-1)^J$ ,  $(m_{B^{*0}} - m_{B^0}) = (m_{B^{*+}} - m_{B^+}) = 45.01 \pm 0.30 \pm 0.23$  MeV, and uses three relativistic Breit-Wigner functions in the fit for mass difference. **$B_J(5840)^+$  WIDTH**VALUE (MeV)EVTSDOCUMENT IDTECNCOMMENT**224 ± 24 ± 80**

7k

<sup>4</sup> AAIJ15AB LHCb  $pp$  at 7, 8 TeV

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

215 ± 27 ± 80

7k

<sup>5</sup> AAIJ15AB LHCb  $pp$  at 7, 8 TeV

229 ± 27 ± 80

7k

<sup>6</sup> AAIJ15AB LHCb  $pp$  at 7, 8 TeV

<sup>4</sup> Assuming  $P = (-1)^J$  and using two relativistic Breit-Wigner functions in the fit for mass difference.

<sup>5</sup> Assuming  $P = (-1)^J$  and using three relativistic Breit-Wigner functions in the fit for mass difference.

<sup>6</sup> Assuming  $P = -(-1)^J$  and using three relativistic Breit-Wigner functions in the fit for mass difference.

### $B_J(5840)^+$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $B^{*0} \pi^+$	seen
$\Gamma_2$ $B^0 \pi^+$	possibly seen

### $B_J(5840)^+$ BRANCHING RATIOS

$\Gamma(B^{*0} \pi^+)/\Gamma_{\text{total}}$					$\Gamma_1/\Gamma$
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
<b>seen</b>	7k	AAIJ	15AB LHCB	$pp$ at 7, 8 TeV	

$\Gamma(B^0 \pi^+)/\Gamma_{\text{total}}$					$\Gamma_2/\Gamma$
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
<b>possibly seen</b>	7k	<sup>7</sup> AAIJ	15AB LHCB	$pp$ at 7, 8 TeV	

<sup>7</sup> A  $B\pi$  decay is forbidden from a  $P = -(-1)^J$  parent, whereas  $B^* \pi$  is allowed.

### $B_J(5840)^+$ REFERENCES

AAIJ	15AB JHEP 1504 024	R. Aaij <i>et al.</i>	(LHCb Collab.)
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