

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

OMITTED FROM SUMMARY TABLE

Quantum numbers shown are quark-model predictions.

 $B_J(5840)^+$ MASSOUR 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

¹ AAIJ15AB LHCB pp at 7, 8 TeV

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

595 ± 26 ± 14

7k

² AAIJ15AB LHCB pp at 7, 8 TeV¹ AAIJ 15AB reports $[m_{B_J^+} - m_{B^0}] - m_{\pi^+} = 431 \pm 13 \pm 14$ MeV which we adjust bythe π^+ 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 $[m_{B_J^+} - m_{B^0}] - m_{\pi^+} = 455 \pm 26 \pm 14$ MeV which we adjust bythe π^+ 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

³ AAIJ15AB LHCB pp at 7, 8 TeV³ 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 π^+ 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

⁴ AAIJ15AB LHCB pp at 7, 8 TeV

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

215 ± 27 ± 80

7k

⁵ AAIJ15AB LHCB pp at 7, 8 TeV

229 ± 27 ± 80

7k

⁶ AAIJ15AB LHCB pp at 7, 8 TeV

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

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

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

$B_J(5840)^+$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $B^{*0} \pi^+$	seen
Γ_2 $B^0 \pi^+$	possibly seen

$B_J(5840)^+$ BRANCHING RATIOS

$\Gamma(B^{*0} \pi^+)/\Gamma_{\text{total}}$					Γ_1/Γ
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
seen	7k	AAIJ	15AB LHCB	pp at 7, 8 TeV	

$\Gamma(B^0 \pi^+)/\Gamma_{\text{total}}$					Γ_2/Γ
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
possibly seen	7k	⁷ AAIJ	15AB LHCB	pp at 7, 8 TeV	

⁷ 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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