$B_J(5840)^0$

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

OMITTED FROM SUMMARY TABLE

Quantum numbers shown are quark-model predictions.

$B_J(5840)^0$ MASS

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

VALUE (MeV)	DOCUMENT ID
5863±9 OUR FIT	

$m_{B_J(5840)^0} - m_{B^+}$

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
584± 9 OUR FIT					
584± 5±7	12k	[1] AAIJ	15AB	LHCB	pp at 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
610±22±7	12k	[2] AAIJ	15AB	LHCB	pp at 7, 8 TeV

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

$m_{B_J(5840)^0} - m_{B^{*+}}$

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
584±5±7	12k	[3] AAIJ	15AB	LHCB	pp at 7, 8 TeV

[3] AAIJ 15AB reports $[m_{B_J^0} - m_{B^+}] - (m_{B^{*+}} - m_{B^+}) - m_{\pi^-} = 444 \pm 5 \pm 7$ MeV which we adjust by the π^- mass. The masses inside the square brackets were measured for each candidate event. The result assumes $P = -(-1)^J$, $(m_{B^{*+}} - m_{B^+}) = 45.01 \pm 0.30 \pm 0.23$ MeV, and uses three relativistic Breit-Wigner functions in the fit for mass difference.

$B_J(5840)^0$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
127±17±34	12k	[4] AAIJ	15AB	LHCB	pp at 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
107±20±34	12k	[5] AAIJ	15AB	LHCB	pp at 7, 8 TeV
119±17±34	12k	[6] AAIJ	15AB	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.

$B_J(5840)^0$ DECAY MODES

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

$B_J(5840)^0$ BRANCHING RATIOS

$\Gamma(B^{*+}\pi^-)/\Gamma_{total}$ Γ_1/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	12k	AAIJ	15AB	LHCB	pp at 7, 8 TeV

$\Gamma(B^+\pi^-)/\Gamma_{total}$ Γ_2/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
possibly seen	[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.

$B_J(5840)^0$ REFERENCES

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