

$B_J(5970)^+$ $I(J^P) = \frac{1}{2}(??)$ Status: **
 I, J, P need confirmation.

Quantum numbers shown are quark-model predictions.

 $B_J(5970)^+$ MASSOUR FIT uses m_{B^0} and $m_{B_J(5970)^+} - m_{B^0}$ to determine $m_{B_J(5970)^+}$.

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>
5964 ± 5 OUR FIT	

 $m_{B_J(5970)^+} - m_{B^0}$

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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685 ± 5 OUR FIT**685 ± 5 OUR AVERAGE**

685.3 ± 4.1 ± 2.5	2K	¹ AAIJ	15AB LHCB	pp at 7, 8 TeV
681 ± 5 ± 12	1.4k	² AALTONEN	14i CDF	$p\bar{p}$ at 1.96 TeV

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

686.8 ± 4.5 ± 2.5	2K	³ AAIJ	15AB LHCB	pp at 7, 8 TeV
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¹ AAIJ 15AB reports $[m_{B_J^+} - m_{B^0}] - m_{\pi^+} = 545.8 \pm 4.1 \pm 2.5$ 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 AALTONEN 14i reports $m_{B_J(5970)^+} - m_{B^0} - m_{\pi^+} = 541 \pm 5 \pm 12$ MeV which we adjusted by the π^+ mass.³ AAIJ 15AB reports $[m_{B_J^+} - m_{B^0}] - m_{\pi^+} = 547 \pm 5 \pm 3$ 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. **$m_{B_J(5970)^+} - m_{B^{*0}}$**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •

686.0 ± 4.0 ± 2.5	2k	⁴ AAIJ	15AB LHCB	pp at 7, 8 TeV
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⁴ AAIJ 15AB reports $[m_{B_J^+} - m_{B^0}] - (m_{B^{*+}} - m_{B^+}) - m_{\pi^+} = 547 \pm 4 \pm 3$ MeV whichwe 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. **$B_J(5970)^+$ WIDTH**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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62 ± 20 OUR AVERAGE

63 ± 15 ± 17	2K	⁵ AAIJ	15AB LHCB	pp at 7, 8 TeV
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$60^{+30}_{-20} \pm 40$ 1.4k AALTONEN 14l CDF $p\bar{p}$ at 1.96 TeV

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$61 \pm 14 \pm 17$ 2K ⁶ AAIJ 15AB LHCB pp at 7, 8 TeV

$61 \pm 15 \pm 17$ 2K ⁷ AAIJ 15AB LHCB pp at 7, 8 TeV

⁵ Assuming $P = (-1)^J$ and using two 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.

⁷ Assuming $P = -(-1)^J$ and using three relativistic Breit-Wigner functions in the fit for mass difference.

$B_J(5970)^+$ DECAY MODES

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

$B_J(5970)^+$ BRANCHING RATIOS

$\Gamma(B^0 \pi^+)/\Gamma_{\text{total}}$					Γ_1/Γ
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
possibly seen	2K	⁸ AAIJ	15AB LHCB	pp at 7, 8 TeV	
possibly seen	1.4k	AALTONEN	14l CDF	$p\bar{p}$ at 1.96 TeV	

⁸ A $B\pi$ decay is forbidden from a $P = -(-1)^J$ parent, whereas $B^* \pi$ is allowed.

$\Gamma(B^{*0} \pi^+)/\Gamma_{\text{total}}$					Γ_2/Γ
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
seen	2k	AAIJ	15AB LHCB	pp at 7, 8 TeV	
seen	1.4k	AALTONEN	14l CDF	$p\bar{p}$ at 1.96 TeV	

$B_J(5970)^+$ REFERENCES

AAIJ	15AB JHEP 1504 024	R. Aaij <i>et al.</i>	(LHCb Collab.)
AALTONEN	14l PR D90 012013	T. Aaltonen <i>et al.</i>	(CDF Collab.)