

$B_J(5970)^+$ $I(J^P) = \frac{1}{2}(??)$ 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 $m_{B_J(5970)^+}$.VALUE (MeV)
5964±5 OUR FITDOCUMENT ID **$m_{B_J(5970)^+} - m_{B^0}$** VALUE (MeV) EVTS DOCUMENT ID TECN COMMENT**685 ±5 OUR FIT****685 ±5 OUR AVERAGE**685.3±4.1± 2.5 2K ¹ AAIJ 15AB LHCB pp at 7, 8 TeV681 ±5 ±12 1.4k ² AALTONEN 14l 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 TeV¹ 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 14l 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. **$m_{B_J(5970)^+} - m_{B^{*0}}$** VALUE (MeV) EVTS DOCUMENT ID TECN COMMENT

• • • 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 TeV⁴ 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>
62 ± 20 OUR AVERAGE				
$63 \pm 15 \pm 17$	2K	⁵ AAIJ	15AB LHCB	$p p$ at 7, 8 TeV
$60^{+30}_{-20} \pm 40$	1.4k	AALTONEN	14i CDF	$p \bar{p}$ at 1.96 TeV

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

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

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

<u>$\Gamma(B^{*0} \pi^+)/\Gamma_{\text{total}}$</u>	<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_2/Γ
	seen	2k	AAIJ	15AB LHCB	$p p$ at 7, 8 TeV	
	seen	1.4k	AALTONEN	14i 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	14i PR D90 012013	T. Aaltonen <i>et al.</i>	(CDF Collab.)