$B_J(5970)^0$

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

Quantum numbers shown are quark-model predictions.

$B_J(5970)^0$ MASS

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

VALUE (MeV)	DOCUMENT ID
5971±5 OUR FIT	

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

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
691 ±5 OUR FIT					
691 ±5 OUR AVERAGE					
689.9±2.9± 5.1	10K	[1] AAIJ	15AB	LHCB	pp at 7, 8 TeV
698 ±5 ±12	2.6k	[2] AALTONEN	14I	CDF	$p\overline{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
714.3±6.4± 5.1	10K	[3] AAIJ	15AB	LHCB	pp at 7, 8 TeV

[1] AAIJ 15AB reports $[m_{B_J^0} - m_{B^+}] - m_{\pi^-} = 550.4 \pm 2.9 \pm 5.1$ 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] AALTONEN 14I reports $m_{B_J(5970)^0} - m_{B^+} - m_{\pi^-} = 558 \pm 5 \pm 12$ MeV which we adjusted by the π^- mass.

[3] AAIJ 15AB reports $[m_{B_J^0} - m_{B^+}] - m_{\pi^-} = 575 \pm 6 \pm 5$ 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.

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

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
691.6±3.7±5.1	10k	[4] AAIJ	15AB	LHCB	pp at 7, 8 TeV

[4] AAIJ 15AB reports $[m_{B_J^0} - m_{B^+}] - (m_{B^{*+}} - m_{B^+}) - m_{\pi^-} = 552 \pm 4 \pm 5$ 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.

$B_J(5970)^0$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
81±12 OUR AVERAGE					
82± 8± 9	10K	[5] AAIJ	15AB	LHCB	pp at 7, 8 TeV

$70^{+30}_{-20}\pm30$	2.6k	AALTONEN	14I	CDF	$p\overline{p}$ at 1.96 TeV

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

$56\pm\ 7\pm\ 9$	10K	[6] AAIJ	15AB	LHCB	pp at 7, 8 TeV
$82\pm10\pm\ 9$	10K	[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.

$B_J(5970)^0$ DECAY MODES

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

$B_J(5970)^0$ BRANCHING RATIOS

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
possibly seen	10K	[8] AAIJ	15AB	LHCB	pp at 7, 8 TeV
possibly seen	2.6k	AALTONEN	14I	CDF	$p\overline{p}$ at 1.96 TeV

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	10K	AAIJ	15AB	LHCB	pp at 7, 8 TeV
seen	2.6k	AALTONEN	14I	CDF	$p\overline{p}$ at 1.96 TeV

$B_J(5970)^0$ REFERENCES

AAIJ	15AB	JHEP 1504 024	R. Aaij *et al.*	(LHCb Collab.)
AALTONEN	14I	PR D90 012013	T. Aaltonen *et al.*	(CDF Collab.)