

$B_c(2S)^\pm$

$$I(J^P) = 0(0^-)$$

OMITTED FROM SUMMARY TABLE

Quantum numbers neither measured nor confirmed.

 $B_c(2S)^\pm$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
6871.6 ± 1.1 OUR AVERAGE				
6872.1 ± 1.3 ± 0.8	24	^{1,2} AAIJ	19Y LHCb	pp at 7, 8, 13 TeV
6871.0 ± 1.4 ± 0.8	51	^{3,4} SIRUNYAN	19M CMS	pp at 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen		⁵ AAIJ	18AL LHCb	pp at 8 TeV
6842 ± 4 ± 5	57	^{6,7} AAD	14AQ ATLAS	pp at 7, 8 TeV

¹ AAIJ 19Y observed $B_c(2S)^+$ in the decay mode $B_c(2S)^+ \rightarrow B_c^+ \pi^+ \pi^-$ ($B_c^+ \rightarrow J/\psi \pi^+$) with 2.2 (3.2) global (local) standard deviations significance.

² AAIJ 19Y reports mass difference measurement of $M(B_c(2S)^+) - M(B_c^+) = 597.2 \pm 1.3 \pm 0.1$ MeV. We have adjusted this measurement with our best value of $M(B_c^+) = 6274.9 \pm 0.8$ MeV. The first uncertainty of the $M(B_c(2S)^+)$ value is a total of uncertainties reported by the experiment and the second one comes from our best value of $M(B_c^+)$.

³ SIRUNYAN 19M observed $B_c(2S)^+$ in the decay mode $B_c(2S)^+ \rightarrow B_c^+ \pi^+ \pi^-$ ($B_c^+ \rightarrow J/\psi \pi^+$) with 6.5 standard deviations significance.

⁴ SIRUNYAN 19M reports mass difference measurement of $M(B_c(2S)^+) - M(B_c^+) = 596.1 \pm 1.2 \pm 0.8$ MeV. We have adjusted this measurement with our best value of $M(B_c^+) = 6274.9 \pm 0.8$ MeV. The first uncertainty of the $M(B_c(2S)^+)$ value is a total of uncertainties reported by the experiment and the second one comes from our best value of $M(B_c^+)$.

⁵ AAIJ 18AL reports an upper limit on the ratio of production cross sections for $[\sigma(B_c(2S)^+)/\sigma(B_c^+)] \cdot B(B_c(2S)^+ \rightarrow B_c^+ \pi^+ \pi^-) < 0.04-0.09$ at 95% CL for the mass value reported by AAD 14AQ.

⁶ Observed in the decay mode $B_c(2S)^+ \rightarrow B_c^+ \pi^+ \pi^-$ ($B_c^+ \rightarrow J/\psi \pi^+$) with 5.2 standard deviations significance.

⁷ Might be the $B_c^*(2S)$.

 $B_c(2S)^\pm$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $B_c^+ \pi^+ \pi^-$	seen

$B_c(2S)^\pm$ BRANCHING RATIOS

$\Gamma(B_c^+ \pi^+ \pi^-) / \Gamma_{\text{total}}$				Γ_1 / Γ
<i>VALUE</i>	<i>EVTS</i>	<i>DOCUMENT ID</i>	<i>TECN</i>	<i>COMMENT</i>
seen	57	¹ AAD	14AQ ATLS	pp at 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen		² AAIJ	18AL LHCB	pp at 8 TeV

¹ Observed with 5.2 standard deviations significance.

² AAIJ 18AL reports an upper limit on the ratio of production cross sections for $[\sigma(B_c(2S)^+) / \sigma(B_c^+)] \cdot B(B_c(2S)^+ \rightarrow B_c^+ \pi^+ \pi^-) < 0.04\text{--}0.09$ at 95% CL for the mass value reported by AAD 14AQ.

$B_c(2S)^\pm$ REFERENCES

AAIJ	19Y	PRL 122 232001	R. Aaij <i>et al.</i>	(LHCb Collab.)
SIRUNYAN	19M	PRL 122 132001	A.M. Sirunyan <i>et al.</i>	(CMS Collab.)
AAIJ	18AL	JHEP 1801 138	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAD	14AQ	PRL 113 212004	G. Aad <i>et al.</i>	(ATLAS Collab.)