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Observation of two excited B_c states and measurement of the $B_c(2S)$ mass in pp collisions at $\sqrt{s} = 13$ TeV with CMS

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The observation of two states consistent with being with the $B_c(2S)$ and $B_c^*(2S)$ states, in pp collisions at $\sqrt{s} = 13$ TeV, is presented.

It is obtained by exploiting an event sample corresponding to an integrated luminosity of 143 fb^{-1} , collected by the CMS experiment

during the whole Run-II of the LHC. These excited $b\bar{c}$ states are observed in the $B_c\pi^+\pi^-$ invariant mass spectrum, with the ground

state B_c reconstructed through its decay to $J/\psi\pi^+$.

The two states are reconstructed with a mass difference equal to 29.1 ± 1.5 (stat) ± 0.7 (sys) MeV.

The mass of the $B_c(2S)$ meson is measured to be 6871.0 ± 1.2 (stat) ± 0.8 (syst) ± 0.8 (B+c) MeV.

Collaboration name

CMS

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