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Hadronization Fractions and Exotic Heavy Flavor at CMS

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Measurements of heavy quark hadronization fractions, or the probabilities f_q that a bottom quark forms one of the weakly decaying B hadrons, are essential for precision measurements of B branching fractions made at hadron colliders and potentially limit searches for new physics in B_s decays. Although once thought to be universal, recent measurements have suggested an environmental and p_T dependence of the ratio f_s/f_u which is examined in detail by new measurements made by the CMS experiment using 62 fb^{-1} of pp collision data at the LHC. Large samples of J/ψ decays have been collected for this purpose using dedicated triggers, which also allow for the reconstruction of exotic charm states decaying to $J/\psi J/\psi$. While the nature of these states remains unclear, CMS confirms the observation of the $X(6900)$ state, and observes two new states denoted $X(6600)$ and $X(7300)$ with significance of 6.5 and 4.1 standard deviations, respectively.

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