Contribution ID: **214** Type: **not specified**

Hadronization Fractions and Exotic Heavy Flavor at CMS

Monday 8 May 2023 15:15 (15 minutes)

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/ψ J/ψ. 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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Session Classification: SM I