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Study the nature of double charm tetraquark in proton-proton collisions

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This talk is based on [Eur.Phys.J.C 84 (2024) 8, 800]. A novel approach is proposed to probe the nature of the double charm tetraquark through the prompt production asymmetry between $T_{\bar{c}\bar{c}}^{-}$ and T_{cc}^{+} in pp collisions. When comparing the compact tetraquark picture and hadronic molecular picture, we find that the former one exhibits a significantly larger production asymmetry, enabling the unambiguous determination of the tetraquark' s internal structure. Additionally, distinctive differences in the transverse momentum and rapidity distributions of $T_{\bar{c}\bar{c}}^{-}$ and T_{cc}^{+} cross sections emerge, particularly at $p_T \approx 2$ GeV and y ≈ ±6 at a center-of-mass energy of 14 TeV. This work can be extended to the exploration of other double heavy tetraquark candidates, offering a versatile approach to advance our understanding of exotic hadrons.

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