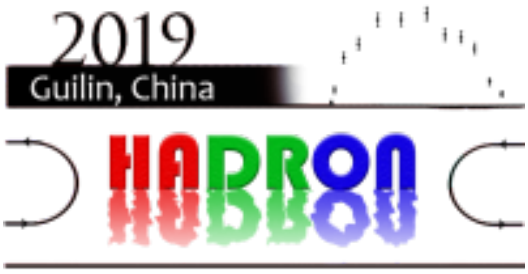

Contribution ID: **217** Type: **Leading parallel**

Deciphering the $X(3872)$ via its polarization in prompt production at the CERN LHC

Saturday, 17 August 2019 16:45 (25 minutes)

Based on the hypothesis that the $X(3872)$ exotic hadron is a mixture of $\chi_{c1}(2P)$ and other states and that its prompt hadroproduction predominately proceeds via its $\chi_{c1}(2P)$ component, we calculate the prompt-X(3872) polarization at the CERN LHC through next-to-leading order in α_s within the factorization formalism of nonrelativistic QCD, including both the color-singlet ${}^3P_1^{[1]}$ and color-octet ${}^3S_1^{[8]}$ Fock states. We also consider the polarization of the J/ψ produced by the subsequent $X(3872)$ decay. We predict that, under ATLAS, CMS, and LHCb experimental conditions, the $X(3872)$ is largely longitudinally polarized, while the J/ψ is largely transversely polarized. We propose that the LHC experiments perform such polarization measurements to pin down the nature of the $X(3872)$ and other X, Y, Z exotic states with non-zero spin.

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