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Production of $P_c(4312)$ state in electron-proton collisions

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We compute electro-production of $P_c(4312)$ in $e^-p^+ \rightarrow e^-P_c$ using Vector Dominance Model assuming four possible spin parity of $P_c(4312)$, $J^P = (1/2)^\pm, (3/2)^\pm$. Electron Ion Collider which is to be built at Brookhaven National Laboratory, we can collide not only unpolarized beam of electron and proton, but also polarized beam so we can investigate more deeply about the angular distribution of $P_c(4312)$. Using high integrated luminosity of Electron Ion Collider, we can predict the yield of $P_c(4312)$ for each spin-parity. We also plot differential scattering cross-section for both unpolarized and polarized beam as a function of pseudorapidity of $P_c(4312)$ in the Lab frame and transverse momentum. Forward to Backward Ratio and Beam Spin Asymmetry helps us to discriminate spin of $P_c(4312)$. Furthermore to specify parity, we study the effect of transverse and longitudinal polarization of J/ψ on decay width of $P_c \rightarrow p + J/\psi \rightarrow p + e^- + e^+$ channel.

Present via

Online

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