



Contribution ID: 61

Type: **Leading contributed talk**

Shedding Light on Exotic Hadrons: Spin-Polarized Electron-Proton collisions at the EIC for Pentaquark Production

Monday, 8 July 2024 16:30 (20 minutes)

The Electron-Ion Collider (EIC) stands as a groundbreaking facility to illuminate the subatomic world, particularly the structure of nuclear matter. This presentation explores the EIC's potential as a new 'pentaquark factory', enabling not only the discovery of new pentaquarks, but also the precise characterization of their properties. Its extraordinary luminosity and spin polarization capabilities will unlock a new era in exotic hadron research. In this talk, I will demonstrate how the spin-polarized electron-proton collisions at the EIC can produce abundant pentaquarks and determine their spin and parity. Focusing on a heavy pentaquark p_c ($uudcc\text{-bar}$) and a light pentaquark p_s ($uudss\text{-bar}$), both produced via photon-induced processes, the vector-meson dominance model is employed to analyze their production cross sections. This talk draws upon studies published in PRD 105 (2022) 11, 114023 and in arXiv:2402.07392.

session

E. Hadron and Nuclear Interactions

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Session Classification: E. Hadron and Nuclear Interactions