



Contribution ID: 235

Type: Poster

Exploring the Feasibility of Imaging Atomic Nuclei at the Electron-Ion Collider with the ePIC Experiment

Tuesday 5 September 2023 17:30 (2h 10m)

Studying atomic nuclei's deformation and substructure, including quadruple, triaxial, and octupole shapes, is crucial to understanding nuclear structure comprehensively. The cluster structures depend on variables such as excitation energy, core clusters, and excess neutrons. Although clusters are tightly bound in low-lying states, the correlation between clusters and their formation is not fully understood. Our ongoing feasibility studies, utilizing different energy and number correlations and momentum correlation function measures, show promising results. We used the proposed EPIC detector at the Electron-Ion Collider and the BeAGLE model to simulate collisions between $e+\text{Be}$, $e+\text{C}$, $e+\text{O}$, $e+\text{Pb}$, and $e+\text{U}$, which will be presented and discussed. Our findings indicate that using the EIC's mid- and forward-rapidity ePIC detectors could provide new insights into alpha clustering and nuclear deformation in atomic nuclei.

Category

Experiment

Collaboration (if applicable)

Authors: DESHPANDE, Abhay; Dr BAKER, Mark; Dr MAGDY ABDELRAHMAN, Niseem (Stony Brook University); LACEY, Roy; LI, Wenliang; TU, Zhoudunming

Presenter: LACEY, Roy

Session Classification: Poster Session

Track Classification: Future facilities/detectors