

The Electron Ion Collider

Ralf Seidl^{1*}

on behalf of the ePIC collaboration

¹*RIKEN, Nishina Center*

Content

The Electron Ion Collider, EIC, is a new collider that is being built at the Brookhaven National Laboratory in the USA. It is going to collide polarized electrons of energies between 5 to 18 GeV with polarized protons of 41 to 275 GeV, as well as various nuclei of energies up to 130 GeV. The main goals of the EIC are the understanding of the spin structure of the nucleon, its three-dimensional imaging in position and momentum space, the behavior at high gluon densities, and the generation of mass from the QCD interaction. The ePIC detector [1] is designed to fulfill the requirements motivated by the planned measurements laid out in the EIC Yellow report [2]. The collaboration consists of 173 institutions from 25 countries all over the world. It is a large acceptance collider detector that includes precision tracking, particle identification, electromagnetic and hadronic calorimetry, as well as dedicated far forward and backward detectors which are designed in close contact with the accelerator.

In this presentation, the EIC project, the ePIC detector and the various physics goals will be presented. Due to the tracking and particle identification capabilities, the detection of strange mesons, hyperons and heavy flavor particles is feasible and an inherent part of the main experimental program. For example, the strange contribution to the total spin of the nucleon using kaon semi-inclusive DIS is one important goal. Also understanding the structure of the kaon itself via the Sullivan [3] process is one of the goals of the EIC. These topics will be particularly highlighted.

Reference

[1] <https://www.epic-eic.org/public/overview.html>

[2] R. Abdul Khalek, et. al, *Nucl.Phys.A* 1026 (2022) 122447

[3] J.D. Sullivan, *Phys.Rev.D* 5 (1972) 1732

Field of Research: Strangeness in hadron structure / Future experiments and facilities

Experiment / Theory: Experiment

Contribution Type: Invited talk