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Electron Ion Collider in China (EicC)

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Lepton scattering is an established ideal tool for studying inner structure of small particles such as nucleons as well as nuclei. As a future high energy nuclear physics project, an Electron-ion collider in China (EicC) has been proposed. It will be constructed based on an upgraded heavy-ion accelerator, High Intensity heavy-ion Accelerator Facility (HIAF) which is currently under construction, together with an additional electron ring. The proposed collider will provide highly polarized electrons (with the polarization $\sim 80\%$), protons and Helium-3 (both with the polarization $\sim 70\%$), as well as unpolarized ion beams from Carbon to Uranium with viable center of mass energy from 10 to 20 GeV and the luminosity of $(2 \sim 4) \times 10^{33} \text{ cm}^{-2} \cdot \text{s}^{-1}$.

The main foci of the EicC will be the precision measurements of the structure of proton in the sea quark region, including 3D tomography of nucleon which reveals the QCD dynamics; the partonic structure of nuclei and the parton interaction with the nuclear environment, in particular, the short range correlation of nucleons and the cold nuclear matter effects; the exotic states, especially those with heavy flavor quark contents. In addition, issues fundamental to understanding the origin of mass could be addressed by measurements of heavy quarkonia near-threshold production at the EicC. In order to achieve the above-mentioned physics goals, a hermetical detector system will be constructed with the cutting-edge technology.

In this talk, the physics program, detector conceptual design and the project status will be reported.

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