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[G02] Latest vertex and tracking detector developments for the future Electron-Ion Collider

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The high-luminosity high-energy Electron-Ion Collider (EIC) to be built at Brookhaven National Laboratory (BNL) will provide a clean environment to study several fundamental questions in the high energy and nuclear physics fields. A high granularity and low material budget vertex and tracking detector is desired to provide precise measurements of primary and displaced vertex, track momentum and spatial projections. The EIC detector 1 collaboration has been formed to develop the technical design for the EIC project detector at the first Interaction Point (IP) towards its construction and operation. The reference design of the EIC vertex and tracking detector consists of the Monolithic Active Pixel Sensor (MAPS) based silicon vertex and tracking subsystem, the Micro-Pattern Gas Detector (MPGD) based gas tracking subsystem and the AC-Coupled Low Gain Avalanche Detector (AC-LGAD) based silicon outer tracker in the pseudorapidity region of -3.5 to 3.5 with full azimuthal coverage. Further detector geometry optimization and technology down selection are under study by the EIC detector 1 collaboration. The latest EIC tracking detector geometry and its performance evaluated in simulation will be presented. Details about the R&D status and progress of the proposed detector technologies, detector mechanical design and readout options will be discussed as well.

contact person e-mail

xuanli@lanl.gov

Primary author: LI, Xuan (Los Alamos National Laboratory)

Presenter: LI, Xuan (Los Alamos National Laboratory)

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