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Forward Silicon Tracker Design and RD for the Future Electron-Ion Collider[1] CHEUK-PING WONG, Los Alamos National Laboratory — The future Electron-Ion Collider (EIC) will utilize high luminosity high energy electron and nucleus collisions to solve several fundamental questions in the nuclear physics field. To study hadronization processes inside and outside a nucleon, heavy flavor and jet are the key measurement at the EIC. Furthermore, these heavy flavor and jet products measured in the nucleus beam going direction can precisely measure the nuclear parton distribution in the poor constrained kinematic region. A forward silicon tracker (FST) integrated with the central silicon vertex detector and other EIC detector subsystems will be critical to realize these forward heavy flavor and jet measurements. The FST with a 1 to 4 pseudorapidity coverage, is proposed to measure trajectories of charged particles to reconstruct or tag heavy flavor particles through the displaced vertex method. With fine spatial and fast time resolutions of the proposed silicon sensor candidates, the preliminary FST design in simulation can cleanly identify heavy flavor particles with a good signal over background ratio. This presentation will summarize the working in progress details about the FST detector design, simulation studies of its tracking performance, silicon sensor options and the future plan.

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Cheuk-Ping Wong
Los Alamos National Laboratory

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