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A forward silicon tracker for heavy flavors and jets measurements at the future electron-ion collider experiments[1] CHEUK-PING WONG, Los Alamos National Laboratory — The future Electron-Ion Collider (EIC) will advance the frontier of nuclear physics by exploring quantum chromodynamics in a wide kinematic range. Benefited by the high luminosity and high energy electron and ion beams, the EIC will be able to obtain the nucleon tomography and study the parton interaction within the nucleon. The heavy flavors and jets measurements will be the key to study hadronization processes inside and outside the nucleon and enhance precision in parton distribution measurement in the poorly constrained kinematic region. Therefore, a forward silicon tracker (FST) will be essential to enhance the signal to background ratio of heavy flavor reconstructions using the displaced vertex method. The FST will provide momentum and vertex measurements of charged particles in pseudorapidity between 1 and 4 for heavy flavor tagging and jet reconstruction. Demonstrated by simulations, the FST can reduce the background for clean heavy flavor particle identification with the use of the proposed silicon sensor candidates which have fine spatial and fast time resolutions. This presentation will summarize the detector performance of the latest FST design in the integrated detector setup from detector simulations, physics simulations studies and the future plan.

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