

High Energy Physics Seminar

Department of Physics

Tuesday, October 1, 2019

“New Heavy Flavor Program for the Future Electron Ion Collider ”

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Abstract: The proposed high luminosity high energy Electron Ion Collider (EIC) will explore the proton/nuclear structure, search for gluon saturation and precisely determine the nuclear parton distribution functions (nPDFs) in a wide x - Q^2 phase space. Heavy flavor measurements at the future EIC will allow us to directly study the nPDFs, the quark/gluon fragmentation processes and energy loss in the nuclear medium within the poorly constrained high Bjorken- x region. We propose to develop a new physics program to study the flavor tagged hadrons/jets, heavy flavor hadron-jet correlations and flavor dependent jet fragmentation processes in the nucleon/nucleus going direction (forward region) at the EIC. The proposed measurements will provide a unique path to explore the flavor dependent fragmentation functions and energy loss in heavy nuclei, which can constrain the initial state effects for previous and ongoing heavy ion measurements at the Relativistic Heavy Ion Collider (RHIC) and the Large Hadron Collider (LHC). To realize these measurements, a forward (proton/nuclei going direction) silicon tracking detector is proposed and the detector R&D and detector design are ongoing with the Los Alamos National Laboratory Lab Directed Research and Developments (LDRD) supports. Details of the proposed physics program, progress of the simulation studies and detector R&D will be discussed in this presentation.

The seminar will be held at 1pm in 2214 SES.