Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Polarized 3He++ Source Development For Future Electron Ion Collider At BNL ANATOLI ZELENSKI, Brookhaven National Laboratory — The nuclear polarization in polarized 3He nuclei is mostly carried by neutrons. The 3He++ beam polarization produced in the source can be preserved during acceleration in high-energy synchrotron accelerators like AGS and RHIC by using the "Siberian snake" technique. In effect, in electron-3He nuclei collisions at EIC we can study the fundamental interactions of polarized electron beam with high-energy polarized neutron beam, complimentary to the studies of the polarized electrons with polarized proton beam collisions. We proposed a new polarization technique for production of high intensity 3He++ ion beam, which is based on ionization of 3He gas (polarized by metastability exchange technique) in the Electron Beam Ion Source (EBIS). The development of the source for EIC is now in progress in collaboration between BNL and MIT. In this paper we will present the recent progress in studies of limitation on the maximum attainable nuclear polarization in the metastability exchange technique in high 5.0T EBIS magnetic field and depolarization effects during polarized 3He gas injection to the EBIS and multi-step ionization processes.

Anatoli Zelenski
Brookhaven National Laboratory

Date submitted: 29 Jun 2020 Electronic form version 1.4