Contribution ID: **57** Type: **not specified**

Development of a Polarized 3He++ Ion Source for the EIC

Thursday, 26 September 2019 15:20 (20 minutes)

The capability of accelerating a high-intensity polarized ^{3}He ion beam would provide an effective polarized neutron beam for new high-energy QCD studies of nucleon structure. This development is essential for the future Electron Ion Collider, which could use a polarized ^{3}He ion beam to probe the spin structure of the neutron. The proposed polarized ^{3}He ion source is based on the Electron Beam Ion Source (EBIS) currently in operation at Brookhaven National Laboratory. ^{3}He gas would be polarized within the 5 T field of the EBIS solenoid via Metastability Exchange Optical Pumping (MEOP) and then pulsed into the EBIS vacuum and drift tube system where the ^{3}He will be ionized by the 10 Amp electron beam. The goal of the polarized ^{3}He ion source is to achieve 2.5×10^{11} $^3He^{++}$/pulse at 70% polarization. An upgrade of the EBIS is currently underway. An absolute polarimeter and spin-rotator is being developed to measure the ^{3}He ion polarization at 6 MeV after initial acceleration out of the EBIS. The source is being developed through collaboration between BNL and MIT.

Summary

Primary author: MUSGRAVE, Matthew (MIT)

Presenter: MUSGRAVE, Matthew (MIT)

Session Classification: EIC

Track Classification: Polarized Sources