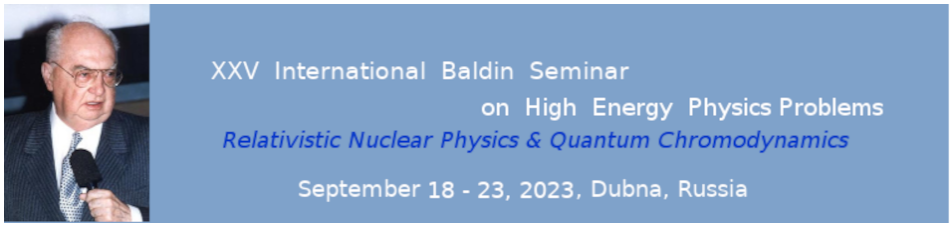

Contribution ID: **117** Type: **not specified**

Optically Pumped Polarized 3He++ Ion Source Development for RHIC/EIC

Friday, 22 September 2023 12:00 (20 minutes)

The proposed polarized 3He++ acceleration in RHIC and the future Electron-Ion Collider will require about 2 × 1011 ions in the source pulse. A new technique had been proposed for production of high intensity polarized 3He++ ion beams. It is based on ionization and accumulation of the 3He gas (polarized by metastability-exchange optical pumping and in the 5 T high magnetic field) after upgrade to Extended (EBIS) Electron Beam Ion Source. A novel 3He cryogenic purification and storage technique was developed to provide the required gas purity. An original gas refill and polarized 3He gas injection to the EBIS long drift tubes, (which serves as the storage cell) were developed to ensure polarization preservation. An infrared laser system for optical pumping and polarization measurements in the high 3–5 T field has been developed. The 3He polarization 80–85% (and sufficiently long ~30 min relaxation time) was obtained in the "open"cell configuration with refilling valve tube inlet and isolation valve closed.The Extended EBIS should also increase un-polarized multiply charged heavy ion production from helium to uranium. A proposal for 3He++ (and multiple charged heavy ions) for NICA collider will be also discussed.

Primary author: Dr ZELENSKI, Anatoli

Presenter: Dr ZELENSKI, Anatoli

Session Classification: Parallel: Polarization phenomena, spin physics