

## Development of a Polarized $H^+/D^+$ Ion Source at IMP

Spin is a fundamental property of particles and plays a crucial role in particle structure and interactions. In a polarized ion beam, the spins of ions favor a particular direction, which is not only crucial for spin physics research but also beneficial for cutting-edge physics experiments that require high precision. For producing intense polarized ion beams, a Spin Polarized Ion Source (SPIS) is under development at the Institute of Modern Physics (IMP, CAS). It is intended to produce polarized proton (deuteron) ion beams of 1 mA, 25 keV, with 100  $\mu$ s pulse width, 5 Hz repetition frequency and polarization of no less than 80%. In this paper, a SPIS consisting of a Polarized Atomic Beam Source (PABS) and a plasma ionizer will be presented. An advanced Lamb-shift Polarimeter (LSP) with a measurement precision of 1% that could be completed within a few seconds have been successfully tested. This polarized ion source will eventually be installed to the HIAF (High Intensity heavy ion Accelerator Facility) injector that will enable HIAF to deliver 9.3 GeV polarized proton and 4.6 GeV polarized deuteron beams. It will not only support a wide range of frontier physical experiments but also pave the way towards the Electron-Ion Collider in China (EicC) strategy.

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