

Proposal for the Charge-Exchange Ionizer Test Bench with Transverse Injection of Polarized Atomic Beams (H/D)

The JINR accelerator complex utilizes the SPI source [1] for generating polarized deuteron and proton beams, based on atomic beam technology with accumulation in a charge-exchange plasma ionizer. The traditional collinear scheme has limitations, including increased beam divergence and higher emittance, which reduce generation efficiency.

To address these issues, an design with a T-shaped storage cell and transverse injection of the atomic beam has been proposed. This configuration reduces system dimensions, increases polarized atom density, and improves beam quality through lower emittance.

The development builds on methodologies described in [1,2] and demonstrates potential for achieving the target luminosity.

[1] Belov A.S. et al., J. Phys.: Conf. Ser. 938 (2017)

[2] Belov A.S., AIP Conf. Proc. 980 (2008)

Primary authors: Dr BELOV, Aleksandr (Institute for Nuclear Research of RAS); SOLOVEV, Aleksandr (Joint Institute for Nuclear Research (JINR)); IVSHIN, Kuzma (JINR); Mrs KUTUZOVA, Ludmila (Joint Institute for Nuclear Research (JINR)); Mr KULIKOV, Michail (Joint Institute for Nuclear Research (JINR)); FIMUSHKIN, Viktor (JINR)

Presenter: SOLOVEV, Aleksandr (Joint Institute for Nuclear Research (JINR))

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