

Polarization, Snakes and Rotators in eRHIC

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Abstract

An electron-ion collider is being considered as a next large facility for nuclear physics studies in United States. Using polarized beams of electrons, protons, and, possibly, light ions is an essential requirement for this collider. eRHIC, the electron-ion collider designed in BNL, takes a big advantage of using existing world-class polarized proton facility RHIC. The polarized electron beam with the energy up to 20 GeV will be delivered either by using an energy-recovery linac accelerator or from a storage ring. In any case spin rotators have to be accommodated in the design to produce longitudinally polarized electrons in collision points in a wide energy range. In the storage ring design approach special spin matching conditions have to be satisfied in order to minimize the depolarization. This presentation describes all aspects of achieving highly polarized beams in eRHIC, including possible modifications in RHIC towards higher polarization of protons and using polarized light ions (^3He).