

Abstract Submitted
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High Luminosity Electron-Hadron Collider eRHIC¹ NICHOLAOS TSOUPAS², BNL — The design of future high-energy high-luminosity electron-hadron collider at RHIC called eRHIC is presented. The design employs two energy recovery linacs (ERL's) to accelerate the electron beam bunches to 20 (potentially 30) GeV and to collide these electron bunches with the circulating hadrons bunches in RHIC. After the collision the electron bunches will be decelerated by the two ERL linacs down to 10 MeV and dumped to a target. The center-of-mass energy of eRHIC will range from 30 to 200 GeV. The luminosity exceeding $10^{34}\text{cm}^{-2}\text{s}^{-1}$ can be achieved in eRHIC using the low-beta interaction region (IR) with a 10 mrad beam crossing. The (IR) will utilize 5 mrad crab cavities for both the hadrons and the electron bunches. The important eRHIC R&D items include: a) the high-current polarized electron source, b) the coherent electron cooling and c) the compact magnets for recirculating passes. We will present a staging scenario of step-by-step, increase of the electron beam energy to the top energy of 30 GeV, by building-up the eRHIC's SRF linacs.

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