

Abstract Submitted
for the APR11 Meeting of
The American Physical Society

High Luminosity Electron-Hadron Collider eRHIC VADIM PTITSYN, ELKE ASCHENAUER, JOANNE BEEBE-WANG, ILAN BEN-ZVI, XIANGUN CHANG, ALEXEY FEDOTOV, HARALD HAHN, YUE HAO, DMITRY KAYRAN, JORG KEWISCH, VLADIMIR LITVINENKO, GEORGE MAHLER, BRETT PARKER, THOMAS ROSER, TRIVENI RAO, BRIAN SHEEHY, JOHN SKARITKA, DEJAN TRBOJEVIC, NICKOLAOS TSOUPAS, JOE TUOZZOLO, GANG WANG, WENCAN XU, WUZHENG MENG, ANIMESH JAIN, LEE HAMMONS, BNL — The design of future high-energy high-luminosity electron-hadron collider at RHIC called eRHIC is presented. We plan adding energy recovery linacs to accelerate the electron beam to 20 (potentially 30) GeV and to collide the electrons with hadrons in RHIC. 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 with a 10 mrad crab crossing. The important eRHIC R&D items include the high-current polarized electron source, the coherent electron cooling and the compact magnets for recirculating passes. A natural staging scenario of step-by-step increases of the electron beam energy by building-up of eRHIC's SRF linacs and a potential of adding polarized positrons are also presented.

Vadim Ptitsyn
BNL

Date submitted: 10 Mar 2011

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