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Upgrade STAR as a possible EIC detector

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An Electron Ion Collider (EIC) is being considered as the next generation QCD facility to understand the fundamental question that how the visible universe is built up. More specifically, the EIC will probe the low Bjorken-x domain where gluons and sea quarks dominate with unprecedented precision, for both nucleon and nuclei. A possible realization of the accelerator facility based on the (currently operating) Relativistic Heavy Ion Collier (RHIC), called eRHIC, is proposed. The STAR detector, as one of the two major experiments at RHIC, has planned to evolve itself to eSTAR with a suite of upgrades optimized for EIC physics programs. The major components of the baseline upgrades will be introduced. The eSTAR detector performance and a broad range of deliverable measurements, which have been identified as the flagship science cases in an EIC, are demonstrated through simulation. An eSTAR has been found to be well suitable for an initial stage of eRHIC.

References:
1. The EIC Whitepaper, The Electron Ion Collider: The Next QCD Frontier, http://arxiv.org/abs/1212.1701
2. eSTAR: The Letter of Intent, the STAR Collaboration, https://drupal.star.bnl.gov/STAR/starnotes/public/sn0592

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