

Why is the CBETA project important for EIC?

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There are already multiple proposals in the world for use of ERL and RLA for example: LHeC, FCC eh at CERN, the ELIC at Jefferson Lab, previous eRHIC Linac ring design at BNL, and EIC@HIAF in China. There are multiple advantages of ERL's - reusing the linacs as it is regularly done at Jefferson Lab where the two recirculating 1 GeV linacs make up to total energy of 12 GeV: reduction of the cost of the superconducting linac, savings in energy as the enormous power created with the 60 GeV electrons in LHeC, for example, could be reduced after collisions to the initial energy. The report from committee of Academy of Sciences in the Assessment of U.S. Based Electron Ion-Collider said it clearly: ...“To reach the performance goals of the proposed EIC conceptual designs, a number of accelerator advances are required. Several of these advances are common to all EIC designs and include the following: advanced magnet designs, strong hadron beam cooling, **high current multi turn ERL technology**, crab cavity operation with hadron beams, the generation of polarized ^3He beams, and development and benchmarking of simulation tools”... The following subsections review these enabling technologies, the present state of the art, and required research and development to meet EIC facility specifications and realize EIC science: Energy Recovery Linacs. ...The ERLs required for electron cooling are at scales much larger than supported by present-day experience, so a number of accelerator physics and technology challenges still need to be overcome with focused R&D and great attention to detailed simulations