

CONCEPTUAL DESIGN OF HIGH LUMINOSITY RING-RING ELECTRON-ION COLLIDER AT CEBAF

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Abstract

A conceptual design of a ring-ring electron-ion collider based on CEBAF with a center-of-mass energy up to 90 GeV at luminosity up to $10^{35} \text{ cm}^{-2}\text{s}^{-1}$ has been proposed at JLab to fulfil science requirements. Four interaction points on two crossing straight sections of Figure 10-8 shape rings are planned for collisions of both highly polarized electron and light ion beams. The Green field design of the ion complex including electron cooling and new way of organizing interacting regions are directly aimed at full exploitation of science program. Here, we summarize design progress including collider ring and interaction region optics with chromatic aberration compensation. Stacking of ion beams in an accumulator-cooler ring, beam-beam simulations and a faster kicker for the circulator electron cooler ring are also discussed.

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