

Possibilities of Low Beta-star, Crab Crossing and Traveling Ion Focus for EIC

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Abstract

We present the estimations and schematics of possible advancements for interaction region of EIC with short, low emittance ion bunches that can be obtained in collider with electron cooling.

Very low beta-star (10 –1 mm as short) can be obtained at compensated chromaticity of final focus. Superconducting high frequency kicker of crab crossing can be positioned before the final focus lenses leaving maximum space available for detectors. This kicker in cooperation with introduced sextupole non-linearity of final focus also can be used for arrangement of traveling ion focus.

These measures are estimated capable to raise the EIC luminosity up to the level of $10^{35}/(\text{cm}^2.\text{s})$.

* This work was supported by the U.S. Dept of Energy under Contract No DE-AC05-84ER40150