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Beam Dynamics Studies for Low-energy Electron Cooler for Electron Ion Collider

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A Low-energy Electron Cooler (LEC) system is presently under design at Brookhaven National Laboratory to cool protons at the Electron Ion Collider (EIC) injection energy. The accelerator for the LEC must provide a high current high-quality electron beam at kinetic energy of 12.5 MeV to the cooling section. In current accelerator design we use DC photo-gun followed by a set of RF cavities to achieve the required operation energy and bunch quality in the cooling section. Beam dynamics in the LEC is determined by strong space-charge effects. In this paper, we discuss the layout of the LEC and present results of beam dynamics simulations.

Footnotes

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