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Simulation of electron beam transport through the coherent electron cooling amplification section using real number of electrons

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Coherent electron cooling plays an important role in the Electron Ion Collider (EIC) by providing a fast cooling rate at collision energy to counter the emittance growth driven by intrabeam scattering effects. In this paper, we report on the high-fidelity simulation of the electron beam transport through the amplification section of the cooling channel. We will show the amplification of the initial modulation in the electron beam from the protons and present the study of collective effects such as the space-charge and CSR effects on the process of modulation amplification.

Footnotes

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