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Collective Effects in the Phase-Space Manipulation of a Low Energy Electron Beam

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Phase-space manipulation of electron beam generated from a photo-injector has been experimentally demonstrated in the past several years at beam energy above 10 MeV. In this paper, we study the multi-stage phase space manipulation of a lower energy beam, such as the beam extracted from a high-brightness photo-cathode RF gun. The numerical simulations of collective effects including space charge, coherent synchrotron radiation are presented.

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