

Abstract Submitted
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Direct and Beat-Wave Excitation of Collective Beam Modes in the Paul Trap Simulator Experiment¹ HUA WANG, ERIK GILSON, RONALD DAVIDSON, PHILIP EFTHIMION, RICHARD MAJESKI, EDWARD STARTSEV, Princeton Plasma Physics Laboratory, STEWART KOPPELL, University of Texas at Austin — The Paul Trap Simulator Experiment (PTSX) is a cylindrical Paul trap that simulates a long, thin charge bunch propagating through an equivalent kilometers-long magnetic alternating-gradient (AG) transport system. An external quadrupole drive is applied to excite collective modes, and experiments on PTSX show that when the charge bunch is driven either directly at the mode frequencies, or indirectly, using beat-wave excitation, the properties and dynamics of the charge bunch are strongly affected. Results are presented from experiments in which the drive amplitude, frequency, and drive duration are varied. The experimental data are compared with results of particle-in-cell (PIC) simulations performed using the WARP particle-in-cell (PIC) code.

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