

ACCELERATOR SEMINAR

“Transverse-to-Longitudinal Phase-Space Exchange: Recent Experiments and Future Applications”

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Techniques to repartition the emittances of an electron beam within the three degree of freedoms have emerged over the last decade. Of particular interest is the transverse-to-longitudinal phase space exchange, a transformation that swaps the emittance between the longitudinal and one of the transverse, e.g. horizontal, phase spaces. Beside exchanging the emittances, this manipulation also enables the arbitrary tailoring of the current profile of an electron bunch. The capability to arbitrarily shape the current profile of an electron bunch has a vast number of applications ranging from accelerator-based light sources to advanced acceleration methods. In this presentation, after describing the concept of phase space exchange and its latest development, I will detail the experimental work carried at the Fermilab's A0 photoinjector. I will conclude with our plans for follow-up and improved phase-space-exchanger experiments at the Fermilab's High-Brightness Electron Source Laboratory (HBESL) and the Advanced Superconducting Test Accelerator (ASTA).

Thursday, June 7, 2012

11:00 a.m.

CEBAF Center, Room F326/327

Coffee before seminar at 10:45 a.m.