

ACCELERATOR SEMINAR

“Tracking Simulation of the Third-Integer Resonant Extraction for the Fermilab Mu2e Experiment”

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The Mu2e experiment at Fermilab requires the acceleration and transport of intense proton beams in order to deliver stable and uniform particle spills to the production target. To meet the experimental requirement, particles will be extracted slowly from the Delivery Ring to the external beamline. Using an accelerator modeling framework for beam dynamics, Synergia2, we have performed multi-particle tracking simulations of the third-integer resonant extraction in the Delivery Ring, including space charge effects as well as physical beamline elements and apertures. We introduce a piece wise linear ramp profile of tune quadrupoles, which could model a uniform structure of particle spills required for the experiment. In order to minimize beam losses which are critical for efficient extraction, we have implemented a number of features, such as apertures in beamline elements, septum plane alignments, etc. The RF Knockout (RFKO) technique is employed as a spill regulation system. Simulation studies have been carried out to optimize the RFKO feedback scheme, which will be helpful in designing the spill regulation system.

Thursday, August 14, 2014

11:00 a.m.

CEBAF Center, Auditorium

Coffee before seminar at 10:45 a.m.