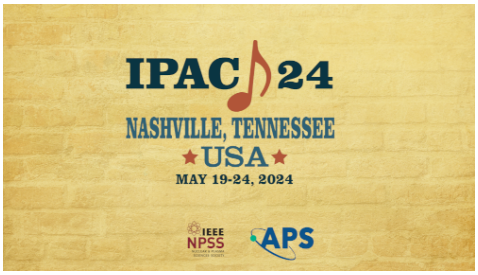

Contribution ID: **1849** Contribution code: **THPC19** Type: **Poster Presentation**

Image based reconstruction of the Danilov-Nagaitsev integrable potential

Thursday, 23 May 2024 16:00 (2 hours)

The integrable optics test accelerator (IOTA) at Fermilab was designed to operate a nonlinear magnet satisfying the Danilov-Nagaitsev integrable potential. At large excitations of this nonlinear magnet the small amplitude vertical tune crosses the integer resonance. At this point the beam splits vertically into two separate beamlets whose separation distance depends on the nonlinear strength. This phenomenon is difficult to study with traditional beam position monitors, so studies of this regime relied on the IOTA synchrotron light imaging system. The 2-D transverse profile of the beam was measured for large excitations of the nonlinear magnet. Using these profiles and accurate knowledge of the rest of the accelerator lattice, the potential could be reconstructed from these profiles and compared to the analytical expectations.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

North America

Primary author: WIELAND, John (Fermi National Accelerator Laboratory)

Co-authors: ROMANOV, Alexander (Fermi National Accelerator Laboratory); VALISHEV, Alexander (Fermi National Accelerator Laboratory); STANCARI, Giulio (Fermi National Accelerator Laboratory)

Presenter: WIELAND, John (Fermi National Accelerator Laboratory)

Session Classification: Thursday Poster Session

Track Classification: MC5: Beam Dynamics and EM Fields: MC5.D01 Beam Optics Lattices, Correction Schemes, Transport