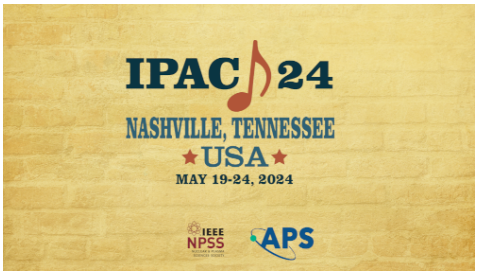

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Exploring varied slow extraction schemes in SIS100

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

The synchrotron SIS100 at FAIR, currently under construction in Darmstadt, Germany, will deliver slow extracted proton and ion beams up to 100 Tm employing resonant extraction. The baseline scheme for slow extraction is transverse knock-out (KO) extraction, but recently the COSE (Constant Optics Slow Extraction) scheme has been studied as an interesting alternative. One advantage is the possibility of compensating the influence of systematic magnetic field errors on slow extraction. Higher order multipoles of the fast ramping compact super-ferric dipole and quadrupole magnets deform the separatrix, leading to an increase in angular spread for particles with different momenta at the electrostatic septum, which results in higher losses. The effect is especially pronounced for the smaller separatrices associated with KO extraction at high energies and for quadrupole driven extraction in general. With COSE, the angular spread can be reduced by adapting chromaticity, decreasing losses at the electrostatic septum to an acceptable level. In this contribution, we report on the status of simulations of slow extraction in SIS100 for different extraction schemes, including COSE.

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