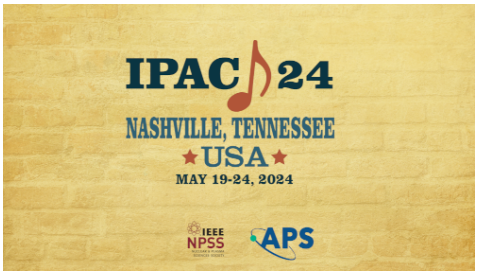

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Transversely driven coherent beam oscillations in the EIC electron storage ring

Monday, 20 May 2024 16:00 (2 hours)

We study coherent transverse beam oscillations in the EIC electron storage ring (ESR), to specify the tolerance for high-frequency ripple of the magnet power supplies. To avoid unacceptable proton emittance growth from the oscillating beam-beam kick from the electrons, the amplitude of these oscillations at the proton betatron frequency needs to be limited to about 1e-4 fraction of the beam size at the interaction point. We show that the oscillations potentially caused by the ESR magnet dipole power supply ripple could be substantial, but still tolerable, if we account for the eddy current shielding in the vacuum chamber. Beam size oscillations, potentially caused by the rippling quadrupole magnet power supplies are also studied and appear manageable.

Footnotes

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