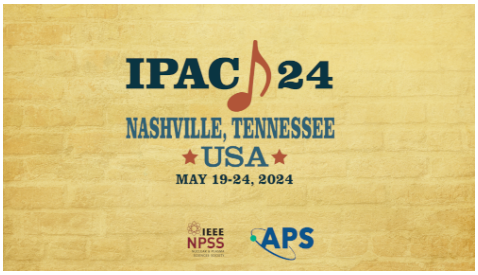

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Pulsed correctors for the beam vertical stability during injection in CESR

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

Beam motion during injections could be a serious problem to x-ray users and jeopardize their experiments. In the Cornell Electron Storage Ring (CESR) the particles are injected with pulsed elements such as pulsed bumpers and septum which could cause transient motion of the stored beam. By analyzing the turn-by-turn position data of the stored beam acquired during injection, we identify the source of beam motion in different time scales.

A new corrector coil is then designed to compensate the beam motion with 0.1 msec duration at a 60 Hz repetition rate in the vertical plane. In addition to the new corrector we also use one of the existing magnet coils to correct 60 Hz kicks and DC offsets. Although, during the last summer down the 60 Hz source was identified and suppressed by an order of magnitude, this corrector is still in use to minimize the injection transient. The waveforms, used to drive the correctors, are extracted based on the beam turn-by-turn coordinates and orbit kick analyses using the 110 CESR Beam Position Monitors data.

In this paper we discuss the requirements and parameters of the new corrector, as well as the correction technique, which is proven to be effective.

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