

Beam position measurements: from pickups to stable beams at cSTART

The KIT project, cSTART (Compact storage ring for accelerator research and technology), aims to demonstrate the injection and storage of sub-ps bunches and the use of LPAs (Laser plasma accelerator) as injector.

The long damping time of the low energy beam (50 to 90 MeV) compared to the storage time grants opportunities to study non-equilibrium beam dynamics. Ultrashort non-equilibrium beams in electron storage rings are expected to strongly evolve, especially in the first few turns after injection. This requires fast and sensitive turn-by-turn beam diagnostics with a high dynamic range. In this talk, we present the cSTART project and elaborate on the beam position diagnostics system including the pickup electrodes and turn-by-turn read-out electronics. Furthermore, we present preliminary results of characterization tests on the BPM readout prototype unit using signal generators. We also show preliminary results on misalignment studies and orbit corrections with varying resolution of the turn-by-turn beam position measurements.

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