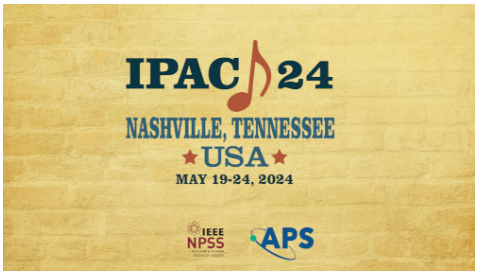

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Magnetic measurement bench for a pulsed non-linear kicker based on vibrating wire

Tuesday, 21 May 2024 16:00 (2 hours)

Transparent off-axis injection in a storage ring by means of a non-linear kicker requires tight field tolerances at the limit of modern technique. To characterize the field profile of the non-linear kicker under development for the ALBA-II storage ring, a dedicated measurement bench based on a variant of the vibrating wire technique was developed. The small size and limited weight of the kicker magnet under study allows for some unusual solution which substantially simplify the set-up. Field mapping is obtained by scanning the magnet aperture, while keeping the wire steady, simplifying considerably the wire tensioning system. The wire is suspended vertically in a pendulum configuration eliminating the wire sagging problem and resulting in an inherently stable wire tension. Furthermore we investigate the possibility to characterize time dependent phenomena, such as the effect of eddy currents induced in the titanium coating of the magnet vacuum chamber, by using using an etherodyne approach where the magnet and the wire are excited by a continuous wave signal with period close to the characteristic kicker pulse period and differing in frequency by the wire resonance frequency

Footnotes

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