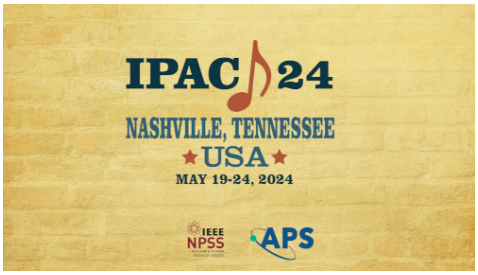

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Slow longitudinal mode-1 instability in electron storage rings with harmonic cavities

Sunday, 19 May 2024 16:00 (2 hours)

Recent studies have revealed an intriguing longitudinal instability that may develop in electron storage rings featuring higher-harmonic cavities. The instability, also referred to as periodic transient beam loading, manifests as a slow oscillation of bunch longitudinal profiles following a coupled-bunch mode-1 pattern. In this contribution, we applied the well-established theory of longitudinal mode-coupling to assess the thresholds and oscillation frequency for this instability. Results obtained through this semi-analytical approach, considering different storage ring and harmonic cavity parameters, were validated using macroparticle tracking and compared against other methods proposed in previous investigations.

Footnotes

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