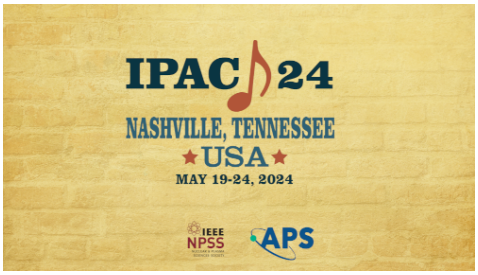

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Ferroelectric fast reactive tuner –technology progress and applications

Wednesday, 22 May 2024 16:00 (2 hours)

In a world's first, CERN recently tested Euclid's prototype ferroelectric tuner with a superconducting cavity, and successfully demonstrated its microphonics compensation*. This Ferroelectric Reactive Tuner (FRT) stands out as the swiftest RF cavity tuner utilizing a ferroelectric ceramic tuning element, boasting an impressive response time below 100 ns. The implications of this advancement are substantial, potentially leading to a significant reduction in the RF power consumption of accelerators across various applications. During this presentation, we will discuss various aspects of this novel tuning technology. Topics to be covered include the development and characterization of ferroelectric materials, metallization techniques, biasing voltage supply, and the FRT designs tailored for SRF microphonic compensations. Specifically, we will introduce a magic-T configuration designed for CEBAF C100, enabling its utilization with a single RF port connected to the cavity. Additionally, we will explore potential applications for other projects such as EIC, LHC, BERLinPro, and beyond.

Footnotes

- N. Shipman et al. Proc. IPAC'21, TUXC03

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