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Virtual Critical Coupling Technique for Elimination of Power Reflections in RF Cavities

Monday 11 August 2025 16:00 (2 hours)

Effective control of power reflections in high-power RF systems is essential for maintaining energy efficiency and protecting system components. Virtual Critical Coupling (VCC) is a novel approach that allows to eliminate reflections by temporally shaping a complex frequency excitation signal in a resonator to ensure that it fully traps all impinging energy. The absorbed energy is stored in the resonator without being dissipated, and it can be released at will. Unlike traditional coupling techniques, this method does not require mechanical modifications. In this talk, we will present VCC experimental results achieved in an S-band standing wave linear accelerator using a custom low-level RF system and a 5 MW klystron. These findings demonstrate a scalable method for improving the efficiency and stability of high-power resonant systems with potential applications in accelerator technology.

Please consider my poster for contributed oral presentation

Yes

Would you like to submit this poster in student poster session on Sunday (August 10th)

No

Footnotes

Funding Agency

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I have read and accept the Privacy Policy Statement

Yes

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