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Mock-up waveguide loop development toward a half-meter scale traveling-wave SRF cavity

Thursday 25 September 2025 14:30 (3 hours)

Traveling-Wave (TW) technology can push the accelerator field gradient of niobium SRF cavity to 70 MV/m or higher beyond the fundamental limit of 50˜60 MV/m in Standing-Wave regime. The success of TW resonance excitation in a proof-of-principle 3-cell SRF cavity in 2 K liquid helium encouraged to advance TW technologies necessary more for future accelerator-scale one. Fermilab has proposed a preliminary RF design of a half-meter scale cavity by considering the physical dimensions of existing SRF facilities and the lessons learned from the 3-cell. It consists of a 7-cell structure and a power feedback waveguide (WG) loop with new TW excitation and control schemes such as, double directional coupler and two WG tuners. Mock-up waveguide loop development was launched under Fermilab LDRD program to demonstrate those new RF schemes at a room temperature. Fabrication drawings of a mock-up loop were completed. More details and plans of the development will be presented.

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Yes

Footnotes

Funding Agency

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