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Progress and challenges in traveling-wave (TW) SRF cavity

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Traveling-wave (TW) technology can push the accelerator field gradient of niobium SRF cavity to 70MV/m or higher beyond the limit of 50˜60MV/m in Standing-wave (SW) technology. The early stages of TW SRF cavity developments had been funded by several SBIR grants to Euclid Techlabs and completed in collaboration with Fermilab through a 1-cell prototype and a proof-of-principle 3-cell TW cavity. The TW resonance excitation in the 3-cell TW cavity at 2K was demonstrated through the low power RF test in early 2024. A high-power test of the 3-cell in TW mode being prepared. To advance a design and technology to fabricate a novel high gradient TW SRF cavity, FNAL proposed a half-meter TW RF design and R&Ds to realize that are in progress. Here we will report the recent progress in the 3-cell TW cavity and the challenges towards a half-meter scale TW cavity.

Footnotes

Funding Agency

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