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Recent progress of Nb3Sn cavity development at KEK

Tuesday 27 August 2024 16:00 (2 hours)

Nb3Sn is one of the most promising materials for the next generation of superconducting RF (SRF) cavities. One reason is that Nb3Sn cavities can achieve high Q-values at 4 K, whereas conventional Nb cavities need to be cooled down to 2 K. This allows for the operation of SRF cavities with conduction cooling, eliminating the need for liquid helium, unlike conventional SRF cavities which require immersion cooling. KEK started Nb3Sn deposition tests on the single-cell cavity based on the Sn vapor diffusion method around 2019 and has steadily improved the cavity performance. In addition, a small deposition furnace for the sample study was constructed last year to investigate the relationship between Nb3Sn film quality and deposition parameters and to improve the throughput of the deposition study. We will report the results of deposition tests on samples and RF measurements of single-cell Nb3Sn cavities.

Footnotes

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