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Cryocooler-based conduction cooling for 1.3 GHz Nb₃Sn superconducting RF cavity

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Superconducting radio frequency (SRF) cavities are, along with superconducting magnets, indispensable technologies for modern particle accelerators. The current cooling method for SRF cavities is immersion in liquid helium bath, which is ideal in terms of cooling because the entire outer surface of the cavity can be maintained at liquid helium temperature. On the other hand, using helium has several difficulties such as costs, availability, large facilities, and high pressure gas safety. Conduction cooling for SRF cavities are currently widely focused all over the world to sweep away above problems.

KEK is pushing conduction cooling technology development for 1.3 GHz Nb₃Sn cavity towards beam acceleration. We have ever done several RF tests under conduction cooling by cryocoolers and copper rings on the cavity equator. In the poster, we will introduce our progress and future plan.

Footnotes

Paper preparation format

Word

Region represented

Asia

Funding Agency

Author: YAMADA, Tomohiro (High Energy Accelerator Research Organization)

Co-authors: ITO, Hayato (High Energy Accelerator Research Organization); SAKAI, Hiroshi (High Energy Accelerator Research Organization); UMEMORI, Kensei (High Energy Accelerator Research Organization)

Presenter: YAMADA, Tomohiro (High Energy Accelerator Research Organization)

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