



Contribution ID: 188

Type: Oral presentation (remote)

High Gradient Testing of a Meter-Scale Distributed-Coupling C3 Accelerating Structures

Wednesday 10 July 2024 09:40 (20 minutes)

In this paper we report on the design, fabrication, tuning and high-power RF testing of the fundamental accelerating structure for the Cool Copper Collider (CCC). The results presented here cover the temperature range from room temperature to liquid nitrogen boil off: 20°C - 77 K

At room temperature, RT, with a N₂ gas purge of 1 atmosphere, the CCC structure was tuned to a resonance frequency of $\langle f_0 \rangle = 5.693\,420$ GHz, at 77K the structure tuned frequency is reported as $\langle f_0 \rangle = 5.712\,057\,667$ GHz. The repeatability of the CCC structure to undergo both vacuum pump down and thermal cycles from RT to LN₂ will be presented.

For the high-power RF testing the CCC structure was immersed in liquid nitrogen at the Radiabeam C-Band test facility. High Power RF breakdown data will be present along with our future experimental plans.

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Session Classification: Normal conducting RF

Track Classification: Accelerator: Normal Conducting RF