



Contribution ID: 1008 Contribution code: THPS057

Type: **Poster Presentation**

Design and optimizations of a 1.5 GHz superconducting cavity cryostat

Thursday 5 June 2025 15:30 (2 hours)

A 3rd harmonic superconducting (SC) cavity working at 1.5 GHz is required to improve beam lifetime and provide Landau damping by lengthening the bunch without energy spread for storage ring of Hefei Advanced Light Facility (HALF). The cryostat, which is used to create a liquid helium temperature environment for the SC cavity, is a key device for stable operation of this SC cavity. This paper presents design of a cryostat for such a SC cavity in detail including mechanical design and thermal analysis. Through optimizations, the calculated heat load is less than 15 W at the operation temperature of 4.5 K.

Footnotes

Paper preparation format

Word

Region represented

Asia

Funding Agency

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Session Classification: Thursday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T13 Cryogenics