



Contribution ID: 1286 Contribution code: WEPS60

Type: **Poster Presentation**

A new superconducting harmonic cavity for HALF storage ring

Wednesday, 22 May 2024 16:00 (2 hours)

A superconducting (SC) 1.5 GHz (3rd harmonic) cavity is being developed for lengthening bunch and improving beam lifetime in the Hefei Advanced Light Facility (HALF) storage ring. This SC cavity is excited by an electron beam with 350 mA current, 1 nC charge, and ~ 6.7 ps length. This contribution presents optimizations on such a SC harmonic cavity in detail. It has a RF coupler to adjust the loaded quality factor and extract RF power out of the cavity from the beam. In combination with a frequency tuner, this permits adjustment of both the amplitude and phase of the harmonic voltage such that the cavity is able to operate at various beam currents. Higher-order-modes are strongly damped using a pair of room-temperature silicon carbide (SiC) rings to meet the requirement of beam instabilities. In addition, preliminary engineering design for the SiC rings is also described in this contribution.

Footnotes

Funding Agency

This work is supported by the “Hundred Talents Program” of the Chinese Academy of Sciences and by the “Fundamental Research Funds for the Central Universities”.

Paper preparation format

Word

Region represented

Asia

Primary author: WEI, Yelong (University of Science and Technology of China)

Co-authors: HUANG, Zhicheng (University of Science and Technology of China); CAO, Zexin (University of Science and Technology of China); SUN, Li (University of Science and Technology of China); FENG, Guangyao (University of Science and Technology of China)

Presenter: HUANG, Zhicheng (University of Science and Technology of China)

Session Classification: Wednesday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T07 Superconducting

RF