Contribution ID: **2120** Contribution code: **TUPM071** Type: **Poster Presentation**

Finalizing the multiphysics design of a high heat-load superconducting undulator

Tuesday 3 June 2025 16:00 (2 hours)

RadiaBeam is developing and manufacturing a 15mm period, high temperature superconductor undulator using Magnesium Diboride (MgB2) wire at 10K-15K temperature range. This temperature range can be achieved by cryocooler, a simpler and less expensive cryogenic solution compared to a liquid helium approach. After optimizing the thermal-mechanical design, the operating temperature is finalized at 7K. We examine the current density, critical field, tensile stress, tensile strain, and temperature of MgB2 wire in multiphysics approach and determine the operating field to be 1.13T with safety margin. A quench-protected power system is developed for training the SCU to the operating point in controlled ramp rate. The SCU will be characterized by in-vacuum pulse wire measurement system.

Footnotes

Paper preparation format

Word

Region represented

America

Funding Agency

U.S. Department of Energy, Office of Basic Energy Science, under contracts DE-SC0022384

Author: CHEN, Yung-Chuan (RadiaBeam Technologies)

Co-authors: SCHILLACI, Alessandro (RadiaBeam); CHIMALPOPOCA, Osvaldo (RadiaBeam Technologies); AGUSTSSON, Ronald (RadiaBeam)

Presenter: CHEN, Yung-Chuan (RadiaBeam Technologies)

Session Classification: Tuesday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.T15 Undulators and Wigglers