Contribution ID: **532** Contribution code: **TUPB100** Type: **Poster Presentation**

Design of a 25 kW fundamental power coupler for conduction cooled Nb3Sn industrial linac

Tuesday 27 August 2024 16:00 (2 hours)

RadiaBeam is designing a 915 MHz, 25 kW CW Fundamental Power Coupler (FPC) to power a Nb3Sn coated superconducting radio-frequency (SRF) cavity. Unlike traditional FPCs for SRF cavities, the device relies only on conductive cooling by cryocoolers. The baseline design was adapted from the liquid helium cooled 805 MHz SNS FPC with the notable addition of an intermediate 50 K thermal intercept and associated RF shield. Engineering design details to address the thermomechanical, manufacturability, and structural challenges will be presented. Particular emphasis will be placed on static and dynamic heat load management along with finite element analysis to validate mechanical stability. Additionally, initial manufacturing studies of the coaxial window brazing will be discussed along with full device manufacturing and integration plans.

Footnotes

Funding Agency

This work has been supported by the ACCELERATE grant and an ARDAP Stewardship by the DOE through Jefferson Lab.

Primary author: THIELK, Seiji (RadiaBeam)

Co-authors: AGUSTSSON, Ronald (RadiaBeam); KUTSAEV, Sergey (RadiaBeam); PRONIKOV, Alexey (RadiaBeam Technologies); ARAUJO MARTINEZ, Aurora Cecilia (RadiaBeam Technologies); VENNEKATE, John (Thomas Jefferson National Accelerator Facility); CIOVATI, Gianluigi (Thomas Jefferson National Accelerator Facility); RIMMER, Robert (Thomas Jefferson National Accelerator Facility)

Presenter: THIELK, Seiji (RadiaBeam)

Session Classification: Tuesday Poster Session

Track Classification: MC4: Technology: MC4.8 Superconducting RF