Contribution ID: **2072** Contribution code: **WEPS097** Type: **Poster Presentation**

Design of a high-power X-band load with circular waveguide TE01 mode input

Wednesday 4 June 2025 16:00 (2 hours)

RF loads are critical components in any high-power rf system. There are two types of commonly used rf loads in multi-megawatt systems: water loads and dry loads. Water loads have a ceramic window separating vacuum from the water. Use of water loads in large scale rf systems is risky because of the possibility of water leaking into vacuum. At SLAC multi-megawatt dry loads were developed and used in S-band and X-Band applications. For example, a compact X-band load based on a tapered WR90 and circularly polarized TE11 mode has been in use for decades. To increase high power performance of a load beyond the state-of-the art, we designed an 11.424 GHz load fed by the TE01 circular waveguide mode. The load is of disk-loaded-waveguide type, built out of a set of cells. The cells are made of magnetic stainless-steel with bulk conductivity is 160000 S/m. The passband of the load is about 180 MHz. The load utilizes axially symmetric TE mode which has minimal surface electric fields. We show the design of the load and results of X-band resonant measurements of the load's cells. The measurements allow us to determine conductivity of the 430 stainless steels after multiple brazing cycles.

Footnotes

Paper preparation format

Word

Region represented

America

Funding Agency

Authors: OTHMAN, Mohamed (SLAC National Accelerator Laboratory); DHAR, Ankur (SLAC National Accelerator Laboratory); DOLGASHEV, Valery (SLAC National Accelerator Laboratory); JONGEWAARD, Erik (SLAC National Accelerator Laboratory)

Presenter: OTHMAN, Mohamed (SLAC National Accelerator Laboratory)

Session Classification: Wednesday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T06 Normal Conducting RF