Contribution ID: **349** Type: **Poster Presentation (120m)**

# Thermal conductance measurement of electrically insulated joints for cryogenic applications

*Thursday 25 July 2024 14:00 (2 hours)*

One of the important aspects of any cryogenic design is to achieve good thermal performance by minimizing the temperature gradient at different contact regions of the thermal mass. In some cases, electrical isolation may be required at contact regions. Different combinations of the thermally conductive and at the same time electrically insulated joints have been characterized using a GM cryocooler based conduction-cooled test rig (CCR). A two stage CCR has been used to cool sample stacks down to 4 K with measured temperature differences across the sample stack up to 110 K, by increasing the 2nd stage temperature. Different types of ceramics and polyimide (Kapton sheet) have been used as an electrical insulator, stacked in between copper blocks and a 2nd stage copper bus bar. Ceramic materials have been coated on copper blocks with surface roughness (roughness average, Ra) that varies from 9 to 14 μm for different ceramics measured, using chromatic white light profilometry (CWLP), whereas bare copper blocks for samples and the 2nd stage copper busbar show a milled finish roughness average of Ra = 1.6 to 3.2 μm. We present a detailed, comparative study of novel thermal contact conductance measurements by using different material combinations.

## Submitters Country

United States

**Author:** Mr SONI, Vijay (GE HealthCare Technology and Innovation Center, Niskayuna, NY 12309, USA)

**Co-authors:** Mr STAUTNER, Ernst Wolfgang (GE HealthCare Technology and Innovation Center, Niskayuna, NY 12309, USA); Mr WU, Anbo (GE HealthCare Technology and Innovation Center, Niskayuna, NY 12309, USA); Mr CONTE, Gene (GE HealthCare Technology and Innovation Center, Niskayuna, NY 12309, USA); Mr VAN EPPS, Christopher (GE HealthCare Technology and Innovation Center, Niskayuna, NY 12309, USA); Mr DOGAN, Celik (GE HealthCare, Florence, SC 29501, USA); Mr XU, Minfeng (GE HealthCare Technology and Innovation Center, Niskayuna, NY 12309, USA); Mr FELTHAM, Stuart (GE HealthCare, Florence, SC 29501, USA)

**Presenter:** Mr SONI, Vijay (GE HealthCare Technology and Innovation Center, Niskayuna, NY 12309, USA)

**Session Classification:** Thu-Po-3.4

**Track Classification:** Tracks ICEC 29 Geneva 2024: ICEC 12: Thermal properties and numerical studies