Contribution ID: **334** Type: **Poster**

C2Po3A-04: Thermal performance test of the cryogenic transfer line for SHINE cryogenic system

Tuesday 20 May 2025 14:00 (2 hours)

Thermal performance of the cryogenic transfer line with long distance and multi-channels is crucial to the efficiency of large helium cryogenic systems built for Shanghai high repetition rate x-ray free electron laser and extreme light facility (SHINE). We have performed several tests to measure the thermal performance of the cryogenic transfer lines developed and optimized for SHINE. The method of liquid helium evaporation rate was chosen to calculate the heat load. In order to fill liquid helium into different channels of the cryogenic lines ready for the test and also measures the corresponding mass flow rate of evaporating helium gas from each channel, respectively, an experiment test setup has been designed and built utilizing the cryogenic system for the SHINE test facility. In total, we have measured three types of cryogenic transfer lines, and the heat load of 0.2 W/m was achieved for the channel employed as the 2 K circle. These results verifies the modified design and are anticipated to improve the cooling power transfer efficiency of the SHINE cryogenic system.

Author: ZHANG, Lei

Co-authors: JIANG, Geyang (Shanghai Advanced Research Institute, Chinese Academy of Sciences); SUN, Jiuce; Ms LEI, Lei (ShanghaiTech University); ZHANG, Peng (Shanghai Advanced Research Institute, Chinese Academy of Sciences); ZHANG, Shuai (Shanghai Advanced Research Institute, Chinese Academy of Sciences); YU, Yibo (Shanghai Advanced Research Institute, Chinese Academy of Sciences); OUYANG, Zhengrong (ShanghaiTech University); WANG, Zhinan (Shanghai Advanced Research Institute, Chinese Academy of Sciences)

Presenter: ZHANG, Lei

Session Classification: C2Po3A - Magnet and Cryomodule Heat Load Management