



Contribution ID: 147

Type: **Poster presentation (105min)**

A Novel Pre-cooling System for Cryogenic Pulsating Heat Pipe

Thursday 10 July 2014 10:30 (2h 15m)

As a highly effective two-phase cooling technique, a cryogenic heat pipe can transport several orders of magnitude larger heat loads than heat conduction of solids such as copper, and it has been used widely for cooling of superconducting magnets, electronic devices and harvesting energy. Among the different types of heat pipes, the cryogenic pulsating heat pipe is a new-type heat pipe which has several outstanding features, such as great heat transport ability, strong adjustability, small in size and simple construction. To reduce the effect of the material of the pipe on the effective thermal conductivity, the pipe of the cryogenic pulsating heat pipe is generally made of stainless steel. Because the thermal conductivity of stainless steel is low and there is no wick in the pipe, the pre-cooling of the evaporator in cryogenic pulsating heat pipes using helium as working fluid to 4.2 K is a problem. In order to solve this problem, we designed a mechanical thermal switch between the cryocooler and the evaporator as a pre-cooling system. The mechanical thermal switch is on during the pre-cooling process, and off during the test process which will not affect the measurement. By using the pre-cooling system to achieve pre-cooling, the cool down time of the cryogenic pulsating heat pipe is reduced significantly.

Author: Mrs XU, dong (Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences)

Co-authors: Mr LIU, huiming (Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences); Prof. LI, laifeng (Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences); Prof. GONG, linghui (Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences); Mr HUANG, rongjin (Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences)

Presenters: Prof. LI, laifeng (Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences); Prof. GONG, linghui (Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences); Mr HUANG, rongjin (Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences)

Session Classification: Thu-Mo-Posters Session 3.4

Track Classification: C-14: New devices and novel concepts