



Contribution ID: 329

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

A Cryogen-free Cryostat for Neutron Scattering Experiments

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

Most ultra-low temperature (below 1K) sample environment experiments at advanced neutron facilities are based on dilution and 3He refrigerator inserts used with Orange cryostats, or similar systems. However recent liquid helium cost increases, caused by global helium supply problems, have raised significant concern about the affordability of such cryostats. Here we present design and test results of a cryogen free top-loading cryostat which provides neutron scattering sample environment in the temperature range 1.25 –300 K. The high cooling power of the cryostat which is 0.23 W at a temperature of less than 2K enables the operation of a dilution refrigerator insert in a continuous regime. The cooling time of a dilution refrigerator insert is similar to one operated in the Orange cryostat. The main performance criteria such as base temperature, cooling power, and circulation rate are compatible with the technical specification of a standard dilution refrigerator. In fact the system offers operating parameters very similar to those of an Orange cryostat, but without the complication of cryogenes. The first scientific results obtained in neutron scattering experiments with this system are also going to be discussed.

Primary author: Dr KIRICHEK, Oleg (ISIS STFC)

Co-author: Mr DOWN, Richard (ISIS STFC)

Presenter: Mr DOWN, Richard (ISIS STFC)

Session Classification: Thu-Mo-Posters Session 3.2

Track Classification: C-05: Cryostat technology