

Transient heat and mass transfer to superfluid helium Application to superconducting magnet cooling

Tuesday 16 September 2014 11:10 (20 minutes)

Comprehending the cooling of superconducting magnets with superfluid helium requires the knowledge of heat and mass transfer in different size and time scales. Moreover, steady-state, transient and phase change must be considered in order to cover a wide spectrum of working conditions and thermal events to which these magnets are subjected. Focusing on the transient heat and mass transfer to superfluid helium for superconducting magnets cooling, we present a non-exhaustive review of experimental measurements and modellings in the ms to μ s time scale. Heat transfer in different configurations (wire, channel, confined geometries...) will be covered as well as the surface heat transfer and the phase change. Some experimental and numerical studies directly related to the cooling of superconducting magnet in superfluid helium will be discussed in more details.

Presenters: BAUDOUY, Bertrand (CEA Saclay); BAUDOUY, Bertrand (IRFU)

Session Classification: Session 3: Heat Transfer R&D