

Advanced Hybrid Current Leads

Wednesday 13 April 2016 17:30 (2 hours)

Hybrid current leads consisting of a warm copper heat exchanger and a cold HTS sections have greatly reduced the refrigeration needs of many applications of superconductors. We have investigated whether it is possible to improve the presently used hybrid current leads. In our opinion improvements are possible by

- using 2nd generation superconductors produced by thin film deposition
- increasing the overlapping length between superconductor and copper for a more efficient use of the refrigerant
- optimizing the geometry of the heat exchanger of the copper section to obtain a maximum heat transfer with a minimum of pressure drop of the coolant
- using a coolant for the refrigerator, which is efficient in the region between 300 K and 70 K -
- avoiding internal section joining surfaces by introduction of appropriate design and manufacturing technologies.

Considering the proposed improvements, first estimations show a potential for remarkable reductions of the thermodynamic losses in the range of about 20 %.

Author: HOLDENER, Fridolin (shirokuma GmbH)

Presenter: HOLDENER, Fridolin (shirokuma GmbH)

Session Classification: Poster session

Track Classification: Infrastructure and Operation