



Contribution ID: 398 Contribution code: TUE-PO1-513-09

Type: Poster

Investigation of HTS Power Devices Cooled by LN₂/CF₄ Mixture

Tuesday, November 16, 2021 1:15 PM (20 minutes)

LN₂/CF₄ mixture would be an effective coolant and insulating medium of high-temperature superconducting (HTS) magnets and power devices, which could provide a cryogenic environment in the temperature range of 50 to 100 K and serve as a liquid dielectric. In this paper, recent progress concerning the LN₂/CF₄-cooled HTS power devices including superconducting fault current limiter (SFCL) and superconducting magnetic energy storage (SMES) is presented with the emphasis focused on their improved electromagnetic characteristics and thermal stability compared with those devices immersed in liquid nitrogen. In addition, the characteristics of SFCL and SMES prototypes immersed in the LN₂/CF₄ mixture are further analyzed from the aspect of thermal and electrical properties of LN₂/CF₄ medium.

Authors: Dr QIU, Qingquan (Institute of Electrical Engineering, Chinese Academy of Sciences); Mr ZHOU, Zhihao (Institute of Electrical Engineering, Chinese Academy of Science); Dr TENG, Yuping (Institute of Electrical Engineering, Chinese Academy of Sciences); Dr SONG, Naihao (Institute of Electrical Engineering, Chinese Academy of Sciences); Mrs JING, Liwei (Institute of Electrical Engineering, Chinese Academy of Sciences); Dr ZHANG, Jingye (Institute of Electrical Engineering, Chinese Academy of Sciences); Dr ZHANG, Guomin (Institute of Electrical Engineering, Chinese Academy of Sciences); Dr XIAO, Liye (Institute of Electrical Engineering, Chinese Academy of Sciences)

Presenter: Dr QIU, Qingquan (Institute of Electrical Engineering, Chinese Academy of Sciences)

Session Classification: TUE-PO1-513 SMES, Transformers, Wireless Power Transfer