



Contribution ID: 805 Contribution code: THU-PO3-405-02

Type: Poster

Analysis of electromagnetic characteristics of a novel no-insulation HTS coil with stainless steel tape wrapped around the outer layer of the coil

Thursday, 18 November 2021 10:00 (20 minutes)

No-insulation HTS magnets with high thermal stability and high current density have great advantages in the fabrication of ultra-high field NMR magnets. However, the turns of the double pancake coil of NMR magnet made by no-insulation technology are usually inconsistent with the theoretical value to keep the outer diameter of the coil consistent in engineering application, which affects the homogeneity of the space magnetic field of the superconducting magnet. Moreover, no-insulation NMR magnets have the disadvantage of charging delay, and parallel winding of stainless steel tape is an effective method in engineering applications, but reducing the magnetic field. In this paper, a novel structure coil with stainless steel tape wrapped around the outer layer of the coil is proposed, and the electromagnetic coupling model is used for analysis. It can adjust the current density, ensure the homogeneity of space magnetic field and the consistency of coil outer diameter, greatly reduce the charging delay time, and reduce the magnetic field loss.

Keywords: no-insulation, NMR magnet, charging delay, current density

Primary authors: WANG, Kangshuai (Institute of Electrical Engineering, Chinese Academy of Sciences); DAI, Yinming (Institute of Electrical Engineering, Chinese Academy of Sciences); LIU, Jianhua (Institute of Electrical Engineering, Chinese Academy of Sciences); QIN, Lang (Institute of Electrical Engineering, Chinese Academy of Sciences); ZHOU, Benzhe (Institute of Electrical Engineering, Chinese Academy of Sciences); WANG, Qiuliang (Institute of Electrical Engineering, Chinese Academy of Sciences)

Presenters: WANG, Kangshuai (Institute of Electrical Engineering, Chinese Academy of Sciences); WANG, Qiuliang (Institute of Electrical Engineering, Chinese Academy of Sciences)

Session Classification: THU-PO3-405 Magnets for NMR