



MT 26
International Conference
on Magnet Technology
 Vancouver, Canada | 2019

Contribution ID: 874

Type: **Poster Presentation**

Wed-Mo-Po3.11-02 [89]: Quench Analysis of an LTS Quadrupole Triplet Magnet System for the IBS RAON Inflight-Fragment Separator

Wednesday, 25 September 2019 09:30 (1h 45m)

In this paper we present quench analysis results of a Low-Temperature Superconducting (LTS) quadrupole triplet magnet system, a part of the In-flight Fragment (IF) separator of a heavy ion linear accelerator complex, named RAON, currently being constructed by the Institute of Basic Science (IBS). This magnet system is composed of three quadrupole magnets: a triplet, surrounded by iron yokes and embedding hexapole/octupole LTS coils for field correction. The magnet will be operated at 4.2 K in liquid helium. For reliable and safe operation of this complex superconducting system, quench and protection analysis with possible failure scenarios must be performed. In this paper, we first discuss probable quench scenarios and then present results of the quench propagation analysis on: 1) coil currents and voltages by multi-coil model circuit analysis; and 2) simulated temperature distribution inside each coil. Our quench analysis results show that the maximum voltage and temperature in each coil are below safety limits, 2000 V and 150 K, respectively, and confirm that this quadrupole triplet magnet system is self-protecting.

Acknowledgement: This work was supported by the Rare Isotope Science Project of Institute for Basic Science funded by Ministry of Science and ICT and NRF of Korea (2013M7A1A1075764)

Primary authors: Dr LEE, Wooseung (Massachusetts Institute of Technology, Francis Bitter Magnet Laboratory / Plasma Science and Fusion Center); Dr PARK, Dongkeun (Francis Bitter Magnet Laboratory / Plasma Science and Fusion Center, Massachusetts Institute of Technology); IWASA, Yukikazu (Francis Bitter Magnet Laboratory / Plasma Science and Fusion Center, Massachusetts Institute of Technology); Dr LEE, Jiho (Rare Isotope Science Project, Institute for Basic Science (IBS)); Dr KIM, Do Gyun (Rare Isotope Science Project, Institute for Basic Science (IBS))

Presenter: Dr LEE, Wooseung (Massachusetts Institute of Technology, Francis Bitter Magnet Laboratory / Plasma Science and Fusion Center)

Session Classification: Wed-Mo-Po3.11 - Quench and Normal Zone Behavior II