



Contribution ID: 621

Type: **Poster Presentation of 1h45m**

A long solenoid HTS magnet with the Joint-less winding technique

Tuesday, 29 August 2017 13:15 (1h 45m)

Persistent current mode operation of a second generation (2G) high temperature superconducting (HTS) magnet is one of the bottleneck techniques for an HTS NMR or MRI applications. In order to realize the persistent current mode in the HTS magnet, the authors had proposed the concept of joint-less winding method with 2G HTS wide conductors and verified successfully that it could maintain reasonable amount of the persistent current in multiple stacked HTS pancake coils with perfect closed superconducting loops. In this paper, we will improve the quality of the magnetic field with a long solenoid HTS magnet wound by the similar technique. Instead of the multiple stacked pancake coils, a single long solenoid HTS magnet with layer winding will be fabricated for the better spatial homogeneity of the magnetic field. The magnet will be operated in the liquid nitrogen first to show the availability of the new solenoid HTS magnet wound by the joint-less winding technique.

“This research was supported by Basic Science Research Program through the National Research Foundation of Korea(NRF) funded by the Ministry of Science, ICT and Future Planning (2016R1A2B4013151);” This research was supported by Korea Electric Power corporation [grant number: 16104]”

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Session Classification: Tue-Af-Po2.05

Track Classification: D1 - Magnets for NMR