



Contribution ID: 710

Type: Poster

Fri-Mo-Po.01-02: Stochastic analysis on the factors affecting critical current and index value of multi-tape co-wound NI HTS coil

Friday 4 July 2025 09:30 (1h 45m)

The estimation of critical current (I_c) and the index value for single-tape wound coils and magnets is relatively straightforward. However, for multi-tape co-wound coils, the process becomes complex due to various factors influencing current distribution within the coil. This study conducts a numerical analysis to explore these factors and their impact on the I_c and index value of multi-tape co-wound HTS coils. An equivalent circuit model, the multi-tape turn distributed circuit, is utilized to represent each tape turn in the coil. Key parameters such as the 77 K self-field I_c of REBCO (Rare Earth Barium Copper Oxide) tape, its index value, contact resistance, and lead resistance are treated as variables during the charging simulation. A stochastic approach is employed to analyze the relationship between these parameters and the coil's I_c and index value through multiple simulations using randomly generated parameter values. The results demonstrate a strong correlation between the coil I_c and the average I_c of the REBCO tapes. Furthermore, the coil index value is found to be significantly influenced by the average contact resistivity between the REBCO tapes.

Author: LEE, Jung Tae (Seoul National University, Republic of Korea)

Co-authors: KIM, Geonyoung (Seoul National University); PARK, Hyunsoo (Seoul National University); PARK, Jeonghwan (Seoul National University); IM, Chaemin (Seoul National University); JANG, Wonseok (Seoul National University); Mr KIM, Jaemin (Seoul National University); HAHN, Seungyong (Seoul National University)

Presenter: LEE, Jung Tae (Seoul National University, Republic of Korea)

Session Classification: Fri-Mo-Po.01 - No-Insulation Coils IV