



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

Contribution ID: 1328

Type: **Poster Presentation**

Thu-Mo-Po4.03-05 [16]: A Numerical Method to Calculate Spatial Harmonic Coefficients of Magnetic Fields generated by Screening Currents in an HTS Magnet

Thursday 26 September 2019 08:45 (2 hours)

This paper presents a numerical method to calculate spatial harmonic coefficients of magnetic fields generated by screening currents in a high temperature superconductor (HTS) magnet. First, current density with screening currents considered in the individual turns of an HTS magnet is calculated using the 2D axisymmetric edge-element formulation and the domain homogenization technique. With these calculated results, the screening current distributions of all elements in the individual turns are transformed into equivalent “loop” currents at the center of mass of each element. Then, from the individual “loop” screening currents, spatial harmonic coefficients of magnetic fields may be obtained by use of combination of elliptic integral and Gaussian quadrature. We applied our approach to calculate spatial harmonic coefficients of selected HTS NMR magnets and compared them with the measured ones.

Acknowledgement

This work was supported by the National Research Foundation of Korea as a part of Mid-Career Research Program (No. 2018R1A2B3009249).

Author: BANG, Jeseok (Seoul National University)

Co-authors: Mr KIM, Jaemin (Seoul National University); BONG, Uijong (Seoul National University); LEE, Jung Tae (Seoul National University); Mr AN, Soobin (Seoul National University); IM, Chaemin (Seoul National University); PARK, Jeonghwan (Seoul National University); PARK, Seong Hyeon (Seoul National University); BHATTARAI, Kabindra (Florida State University); HAHN, Seungyong (Seoul National University)

Presenter: BANG, Jeseok (Seoul National University)

Session Classification: Thu-Mo-Po4.03 - Novel Diagnostics and Other Techniques