Contribution ID: **193** Contribution code: **TUE-PO1-305-10** Type: **Poster**

Finite Element Analysis of AC Loss Properties in Pancake Coils Wound Using Two-ply Bundle Conductor

Tuesday, November 16, 2021 1:15 PM (20 minutes)

AC losses in stacked bundle conductors exposed to external magnetic fields are numerically evaluated by means of a two-dimensional finite element method formulated using a self-magnetic field due to currents induced in an analysis region. The bundle conductor is composed of two pieces of rare-earth-based coated conductors without electrical insulation to improve the thermal stability. In the analysis models, an idealized copper layer is sandwiched by a pair of superconducting layers in every bundle conductor. The external magnetic fields are increased monotonically from zero so as to simulate the electromagnetic responses in several typical parts inside a pancake coil for high field magnet. In order to understand only the geometrical effects on the AC losses, the superconductors are assumed to be subject to the Bean model, in which the critical current density is independent of the local magnetic field. The influences of the numbers of bundle conductors, the gaps between bundle conductors and the angles of applied magnetic fields on the AC losses are investigated numerically.
This work was supported by JSPS KAKENHI Grant Number JP18H0528.

Primary authors: Prof. KAJIKAWA, Kazuhiro (Sanyo-Onoda City University); Mr ZHU, Botao (Kyushu University); Prof. AWAJI, Satoshi (Tohoku University); Prof. BADEL, Arnaud (Tohoku University); Dr TAKAHASHI, Kohki (Tohoku University); Dr OKADA, Tatsunori (Tohoku University); Dr ABE, Toru (Tohoku University)

Presenter: Prof. KAJIKAWA, Kazuhiro (Sanyo-Onoda City University)

Session Classification: TUE-PO1-305 HTS/LTS coil