Contribution ID: **501** Type: **Poster**

Wed-Mo-Po.04-04: Finite Element Analysis of Bending Behavior in Stacked HTS CICCs for Large-Scale High-Field Magnets

Wednesday 2 July 2025 09:15 (2 hours)

Large-scale superconducting magnets, characterized by their substantial diameter and high magnetic field strength, play a pivotal role in various high-field applications. To optimize the performance of these magnets, it is crucial to understand the mechanical behavior of the superconducting conductors used in their construction. This paper introduces a finite element model (FEM) developed to analyze the bending behavior of stacked high-temperature superconducting (HTS) Cable-in-Conduit Conductors (CICCs) tailored for large-scale, high-field magnets. The model simulates the bending of long conductors into the dimensions required for target coils and examines the mechanical performance of the conductors at different positions along the tape. This analysis extends beyond previous studies that focused on the bending properties of short conductors, providing a more realistic representation that aligns with the actual dimensions of large-scale magnets. Such an approach enhances the understanding of the mechanical behavior of HTS conductors in practical applications, supporting more accurate performance assessments for large-scale superconducting magnets. The results of this study contribute to more accurate performance assessments of HTS conductors, aiding in the design and development of more reliable and efficient large-scale superconducting magnets.

Author: YANG, Shige

Co-authors: TANG, Bohan (High magnetic field laboratory of Chinese Academic of Science); JIANG, Donghui (High Magnetic Field Laboratory, Hefei Institutes of Physical Science, Chinese Academy of Sciences); KUANG, Guangli (High Magnetic Field Laboratory, CAS); Mr LI, Guoruihang; YU, Hui; JIANG, Shili (High Magnetic Field Laboratory, Hefei Institutes of Physical Science, Chinese Academy of Sciences); BOWEN, Xie

Presenter: YANG, Shige

Session Classification: Wed-Mo-Po.04 - HTS Conductors I