



Contribution ID: 233

Type: **Poster**

M2Po3E-04: Friction Coefficient Measurements for High-Temperature Superconducting Magnet Design

Tuesday 20 May 2025 14:00 (2 hours)

Accurate prediction of mechanical stress within high-field superconducting magnets is crucial for ensuring their structural integrity and operational reliability. Friction between turns plays a significant role in load transfer and stress distribution within the magnet winding. However, limited experimental data, especially at cryogenic temperatures, hinders precise modeling and design. This study addresses this knowledge gap by measuring the friction coefficient between REBCO and co-winding tapes at both room temperature (295 K) and cryogenic temperature (77 K). A novel experimental setup was developed to measure the friction force under controlled conditions. The influence of various factors, such as transverse load and temperature, on the friction coefficient was investigated. The results of this study provide valuable insights into the tribological behavior of superconducting tapes at cryogenic temperatures. These findings have been used to refine mechanical models and simulations of superconducting magnets, leading to improved design and optimization.

Acknowledgement

This work was performed at the National High Magnetic Field Laboratory, which is supported by National Science Foundation Cooperative Agreement No. DMR-1644779, DMR-1839796, DMR- 2131790, and the State of Florida.

Authors: Dr INGROLE, Aniket (National High Magnetic Field Laboratory (NHMFL), Florida State University); LU, Jun

Presenter: Dr INGROLE, Aniket (National High Magnetic Field Laboratory (NHMFL), Florida State University)

Session Classification: M2Po3E - Characterization of REBCO Conductors I