



Contribution ID: 173

Type: **Poster**

Fri-Af-Po.02-01: Enhanced Quench Stability of Coils Employing Defect-Tolerant REBCO Conductors

Friday 4 July 2025 14:00 (2 hours)

High-temperature superconductors (HTS) are being implemented in magnets and coils for fusion energy, aviation, wind generators, high-energy physics, and nuclear magnetic resonance. HTS coils face a critical challenge for use in these applications: their inherently slow quench propagation velocity complicates quench detection and protection, raising concerns about operational safety and reliability. Addressing these issues demands advancements in coil stability and defect tolerance.

In this work, we have investigated the quench stability of HTS coils fabricated using defect-tolerant REBCO tapes. Notably, we have developed innovative tape architectures such as double-sided tapes and Slot 'n' Fill Tapes which incorporate slots within the insulating buffer stack that are filled with a conductive material. These new architectures enable efficient current-sharing with the substrate, significantly improving quench stability margins and enhancing the coil's tolerance to localized defects.

This work was funded by U.S. Naval Sea Systems Command Small Business Technology Transfer award N68335-23-C-0228 through AMPeers LLC.

Author: Dr RONG, Jian (University of Houston)

Co-authors: GOEL, Chirag (University of Houston); SINGH, Harshit (University of Houston); SANDRA, Jithin sai (AMPeers LLC); ZHU, Lingfeng (University of Houston); MAI, Nghia (AMPeers LLC); XUE, Shengchen (AMPeers LLC); SAMBANGI, Umesh (AMPeers LLC); SELVAMANICKAM, Venkat

Presenter: Dr RONG, Jian (University of Houston)

Session Classification: Fri-Af-Po.02 - Quench Detection and Protection III