

# Quench protection of high temperature superconducting magnet using metal-insulation technology

*Monday 19 June 2023 17:00 (15 minutes)*

Magnets based on high temperature superconductor (HTS) provides an extreme sample environment to provide a magnetic field to detect weaker, often diffuse signals of (quantum) disordered systems. Therefore, studying HTS magnet behavior and quench properties is an essential aspect of neutron research instrumentation. In this project, we are using metal -insulation co-winding technology, where coating a superconductor with conducting over nonconducting layer has the ability to bypass the current through resistive regions reacting to reduce the risk of quench damage. This could be one of the methods to protect the magnets from possible overheating or overvoltage conditions. In this project, we are constructing a small demonstrator HTS metal-insulated coil to study the quench behavior experimentally. For initial designing a coil, we are using finite element method (FEM) simulations to calculate magnetic fields, the magnetic forces, and the thermal management study. The demonstrator HTS coil to be tested in a standard FRM-II CCR cryostat with 80mm sample tube.

**Primary authors:** GHANATHE, Madhu (Postdoctoral researcher); MUEHLBAUER, Sebastian

**Presenter:** GHANATHE, Madhu (Postdoctoral researcher)

**Session Classification:** Parallel 1