



Contribution ID: 170

Type: **Poster Presentation**

Insulation system for high temperature superconductor cables

Wednesday 1 July 2015 09:00 (2 hours)

Large-scale superconductor applications, like fusion magnets, require high-current capacity conductors to limit system inductance and peak operating voltage. Several cabling methods using high temperature superconductor (HTS) tape are presently under development so that the unique high-field, high-current-density, high operating temperature characteristics of 2nd generation ReBCO coated conductors can be utilized in next generation fusion devices. Large-scale magnets are generally epoxy impregnated to support and distribute electromagnetic stresses through the magnet volume. However, the present generation of ReBCO coated conductors are prone to delamination when tensile stresses, such as those that occur during epoxy cure or during cooldown, are applied to the broad surface of ReBCO tapes. We present the development of a conductor insulation system which effectively insulates HTS cabled conductors at high withstand voltage while simultaneously preventing the intrusion of the epoxy impregnant into the cable, thus eliminating degradation due to conductor delamination. We also describe a small-scale coil test program to demonstrate the effect of the cable insulation scheme and present preliminary test results.

Supported by the US Department of Energy, Office of Fusion Energy Science SBIR Award DE-SC0011862.

Author: Dr MICHAEL, Philip (MIT - Plasma Science and Fusion Center)

Co-authors: Dr HAIGHT, Andrea (Composite Technology Development, Inc.); Ms KANO, Kimiko (Composite Technology Development, Inc.); Dr BROMBERG, Leslie (MIT - Plasma Science and Fusion Center)

Presenter: Dr MICHAEL, Philip (MIT - Plasma Science and Fusion Center)

Session Classification: M3PoB - Cryogenic Materials VI: Insulation

Track Classification: ICMC-12 - Insulation and Impregnation Materials