



Contribution ID: 837

Type: **Regular 15 minutes Oral Presentation**

Quench propagation and degradation limits of pre-strained HTS tapes with a spot heater

Tuesday, 29 August 2017 09:00 (15 minutes)

Quench propagation and degradation properties are critical in quench detection and protection of high temperature superconductor (HTS). It is essential to understand the strain influence on quench propagation velocity (QPV) and degradation limits in HTS in practical applications since there are unavoidable for pre-strain and deformation in its manufacture and operation. In the present work, the quench propagation and degradation behaviors of critical property for pre-strained high temperature superconducting composite tapes are investigated experimentally during a heater triggered quench process. The distributed voltage taps, low-temperature strain gauges and thermal couples are attached on the tape to measure the QPV, strains and the quench degradation limits. In addition, the numerical predictions are presented to discuss the inherent relationship between the pre-strains and quench behaviors of the pre-strained HTS tape. It shows a reasonable consistent with the experimental data. Preliminary results indicate that the QPV increases and the degradation limits decrease for large pre-strained tape with tension deformation. The correlation between detection strain and hot point temperature is analyzed and discussed in detail. The potential applications with pre-strained HTS tape on the quench detection and protection are also discussed.

Submitters Country

China

Primary author: Prof. WANG, Xingzhe (Lanzhou University)

Co-authors: Mr TONG, Yujin (Lanzhou University); Mr DU, Haisen (Lanzhou University); Mr QIN, Huadong (Lanzhou University)

Presenter: Mr TONG, Yujin (Lanzhou University)

Session Classification: Tue-Mo-Or12

Track Classification: G2 - Quench and Normal-Zone Behavior