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Type: **Invited Oral Presentation**

M1Or3B-02 [Invited]: ReBCO processing techniques and cryogenic measurements to enhance 2G HTS quality

Monday, 22 July 2019 16:25 (25 minutes)

STI continues to improve our High Temperature Superconducting (HTS) ReBCO coated conductor production and metrology techniques to deliver higher-performance & lower-cost superconducting products to our customers in key application markets. In this talk, we'll cover (3) areas of our recent focus to enhance our product qualities; Long length in-field metrology for 2G HTS characterization, Process controls for higher performance ReBCO film properties during growth, & slitting processes to minimize yield loss for narrow gauge applications.

Metrology: A goal for our Dept. of Energy grant is to develop ReBCO characterization measurements up to 2 Tesla B-Field & at all-angles & 65K on continuous long-length superconductor tapes. STI is working on a cryogenic sensor technology for an inline superconductor measurement machine & will report on progress.

Process Control: 2G HTS ReBCO superconductor crystal growth is best accomplished in precisely controlled oxygen partial pressure and at high temperatures (>750oC). STI is working with Fiber Bragg arrays for improved in-situ high temperature process control accuracy & repeatability in large area furnaces to achieve higher yield production and lower costs.

Slitting: STI grows ReBCO 2G HTS on foil substrates up to 550m long x 16mm wide. Some product applications require the superconductors to be as thin as 1mm, like discrete wires. We'll review slitting effects on superconducting wire quality over long-lengths and our findings on different processing techniques used to-date.

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