



Contribution ID: 919 Contribution code: THU-PO3-717-03

Type: Poster

## Development of a Simple Measurement System for Electromechanical Performance Evaluation of REBCO Coated Conductor Tapes

*Thursday, November 18, 2021 10:00 AM (20 minutes)*

The superior electromechanical properties (EMP) of REBCO coated conductor (CC) tapes made them enabled to be utilized in a wide range of practical superconducting applications such as coils, magnets, and generators. However, the extreme application environments degrade the current-carrying capabilities so it is important to develop a technique to evaluate the EMPs and their reversible limits for the design. Thus, the investigation of strain/stress dependence of critical current,  $I_c$  under different stress and strain modes, and a magnetic field is important. Moreover, understanding the  $I_c$  degradation behaviors of the CC tapes at the low magnetic field will provide an effective information in predicting the  $I_c$  behavior at operating conditions of a high magnetic field and low temperatures. The design data such as irreversible stress and strain limits ( $\sigma_{irr}/\epsilon_{irr}$ ) for  $I_c$  degradation will further improve the design efficiency of superconducting devices. Therefore, in this study, the EMPs of the REBCO CC tape at 77 K were evaluated using our recently developed easy-to-use measurement system that can continuously measure variations in  $I_c$  while applying a load or deformation. Through the feedback control of voltages induced at the voltage taps on the sample under tensile load, it was possible to depict the  $I_c$  degradation behavior of the CC tapes due to the cracking of the REBCO film. Also, the strain sensitivity of  $I_c$  degradation under a magnetic field of differently stabilized HTS CC tapes can be evaluated.

**Primary author:** DIAZ, Mark Angelo (Andong National University)

**Co-authors:** Dr DE LEON, Michael (Andong National University); SHIN, Hyung-Seop (Andong National University); Dr MEAN, Byeong-Jin (SuNAM Co. Ltd.); Dr LEE, Jae-Hun (SuNAM Co. Ltd.)

**Presenter:** DIAZ, Mark Angelo (Andong National University)

**Session Classification:** THU-PO3-717 Mechanical Behavior of Conductor