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 18 November 2021 10:00 (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, Ic under different stress and strain modes, and a magnetic field is important. Moreover, understanding the Ic degradation behaviors of the CC tapes at the low magnetic field will provide an effective information in predicting the Ic behavior at operating conditions of a high magnetic field and low temperatures. The design data such as irreversible stress and strain limits (σirr/εirr.) for Ic 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 Ic 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 Ic degradation behavior of the CC tapes due to the cracking of the REBCO film. Also, the strain sensitivity of Ic 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