



Contribution ID: 531

Type: Invited Oral

## M2Or3H-03: [Invited] A report on the international round-robin test for electromechanical properties of HTS composite tapes by uniaxial tensile testing at liquid nitrogen temperature

*Tuesday 11 July 2023 16:55 (20 minutes)*

So far, the round-robin-test has been proposed and successfully performed to establish the standard of the test method for measuring the mechanical properties and the critical current of superconducting properties of various composite superconducting wires, and has contributed significantly to the establishment of international standards (IS). With the development of high-performance HTS wires and their applications to coils/magnets, establishing standard methods for evaluating their electromechanical properties (EMPs) at cryogenic temperatures has become important. This time, an international round-robin test was promoted to establish a test method for the electromechanical properties of HTS composite wires at liquid nitrogen temperature. Tensile tests were performed to measure the critical current based on the stress intervals at cryogenic temperatures for three REBCO tapes and one kind of BSCCO tape. Samples were distributed to 6 participating laboratories in 5 countries for testing according to specified guidelines. Test results delivered from all participants were evaluated using statistical tools to investigate the main causes of scattering in the test results and their magnitude. The EMPs assessed were critical current ( $I_c$ ), reversible stress limit ( $R_{rev}$ ), and retention stress limit ( $R_{ret}$ ), which were determined through a stress-based test method. The  $I_c$  measurements were conducted using broad and narrow stress intervals, and reversible and retention stress limits were defined based on specific 99%  $I_{c0}$  recovery and 95%  $I_{c0}$  retention criteria. The objectives of RRT are to establish an IEC standard for a testing method of the electro-mechanical properties of HTS wires, including REBCO, under uniaxial tension. The RRT results for the electro-mechanical property test of HTS wires under tension at liquid nitrogen temperature are presented and discussed.

**Acknowledgments:** This work was supported by KEIT grant funded by the Korean government (MOTIE) (Grant No. 20020421). It was partially supported by the National Research Foundation of Korea (NRF) grant funded by the Korean government (MSIT) (No. 2022M3I9A1076881).

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**Session Classification:** M2Or3H: Special Session: Electromechanical Behaviors of HTS Conductors for Applications - Part II