Contribution ID: **324** Type: **Contributed Oral Presentation**

Non-destructive characterization of local Ic variation in a long length Bi-2223 tape

Tuesday 30 June 2015 11:00 (15 minutes)

Spatial homogeneity of critical current, Ic, is one of the most important performances of practical HTS tapes. Such Ic homogeneity is typically characterized by the reel-to-reel transport measurement with a tap distance of several tens cm to several m. However, the spatial resolution is not enough in the conventional method to detect local Ic drop, especially in the case of Bi-2223 tape because of a small shunt resistance of the Ag sheath. In this study, we have succeeded in measuring in-plane Ic distribution in a commercial 100-m-class Bi-2223 tape with non-contact and non-destructive manner by using reel-to-reel high speed scanning Hall probe microscopy. This allows us to measure high resolution remanent flux image on the tape surface in liquid nitrogen bath with a spatial resolution of 34 um in width and 830 um in length. Traveling speed of the tape during the measurement was 36 m/h at maximum. By solving the inversion problem, we obtained in-plane Ic distribution in the tape. We have succeeded in analyzing Ic fluctuation over multi-scale length more than 5 decades. To check the validity of the Ic value, we also carried out site-specified four-probe measurements, then confirmed that these two measurements showed good agreement each other. Statistical behavior of the Ic fluctuation and the correlation with microstructure will be discussed.

This study was supported by the "JST: S-Innovation" and "JSPS: KAKENHI (24760235)".

Author: KISS, Takanobu (Kyushu University)

Co-authors: Dr KITAGUCHI, Hitoshi (National Institute for Materials Science); HIGASHIKAWA, Kohei (Kyushu University); INOUE, Masayoshi (Kyushu University)

Presenter: KISS, Takanobu (Kyushu University)

Session Classification: M2OrB - Superconductor Wires I: Testing and Characterization

Track Classification: ICMC-03 - BSCCO Processing and Properties