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M3Or3H-04: [Invited] Electro-magnetic tape width of REBCO coated conductors characterized by reel-to-reel scanning Hall-probe magnetic microscopy

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Because of the tape architecture of the REBCO coated conductors (CCs), it is crucial to grasp the size of the tape width and its variation along the length for the design of magnets or coils. Geometrical size can be measured relatively easily by such techniques as laser microscopy or optical microscopy, however, the electromagnetic tape width, at where the superconducting current can flow, is not well characterized so far. It should be relevant for understanding the influence of shielding current due to magnetization of the tape strands. It has been also pointed out that the quality of the tape edge is crucial for the reliability of coiling, i.e., micro-crack formation as a result of slitting may cause deterioration of the magnet due to high strain during the operation. The electromagnetic tape width can be a good indicator for the evaluation of the quality of the tape edges after slitting. In this study, we will describe electromagnetic tape width of commercially available long REBCO CCs based on reel-to-reel scanning Hall probe magnetic microscopy [1]. Thanks to its high spatial resolution along the tape width not only along the longitudinal direction, it allows us to evaluate electromagnetic tape width continuously as a function of longitudinal position. This is very unique data on the electromagnetic characteristic of long REBCO CCs.

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[1] K. Higashikawa, K. Katahira, K. Okumura, K. Shiohara, M. Inoue, T. Kiss, Y. Shingai, M. Konishi, K. Ohmatsu, M. Yoshizumi, T. Izumi, "Lateral Distribution of Critical Current Density in Coated Conductors Slit by Different Cutting Methods", IEEE Trans. Appl. Supercond., Vol. 23, No. 3, 6602704, 2013.06, DOI: 10.1109/TASC.2013.2238983

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