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Thu-Af-Or24-03: Novel Characterization Technique to Visualize Local Defects in a REBCO Pancake Coil Winding

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It is relevant to establish a reliable coil winding techniques which is free from local defects and/or delamination of REBCO tape strand. A coil is usually tested by measuring transport current-voltage characteristics as a whole, however, the position and distribution of the defects can not be identified from such global measurements. This prevent us from clarifying the mechanism of the degradation by the coiling. In this study, we have succeeded in developing a novel method to visualize local defects in a pancake coil winding with a high spatial resolution of a single tape thickness. This allows us to collect information on local degradation in the coil winding, i.e., a powerful method as a diagnostic technique in order to screening out a degraded coil. This is also very useful to investigate degradation mechanism and to improve coil winding methods. We adopted this method to investigate the properties of a large shielding coil used for a half-size REBCO based MRI magnet. Test results using an artificial tape stack including a single non-superconducting tape with a thickness of 100 μm and the measurement results on the actual sheilding coil will be presented.

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