

# **Investigation of In-field Spatial Homogeneity of Local Critical Current in Coated Conductor Based on Reel-to-reel Characterization Methods**

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We have investigated in-field spatial homogeneity of local critical current in a coated conductor based on reel-to-reel characterization methods. Understanding of the local homogeneity in coated conductors has become one of the most important issues for establishing practical applications because a local defect may cause local burnout before being detected due to their very slow velocity in quench propagation. Magnetic characterization methods, e.g., TAPESTAR<sup>TM</sup> as a de facto standard, RTR-SHPM developed by us, etc., are very useful for investigating such local homogeneity in a long coated conductor with good spatial resolution. On the other hand these characterization methods are so far applicable in near self-field condition less than several 10's of mT although coated conductors are expected to be used in in-field conductions. In this study, by extending and developing the measurement systems, we have succeeded in characterizing in-field spatial homogeneity in a coated conductor. For example, (1) two-dimensional in-plane distribution of in-field local critical current density and (2) one-dimensional longitudinal distribution of in-field local critical current up to 5 T can be characterized by the systems. These findings will be crucial information for determining a design criterion for magnet applications and also for selecting an appropriate measurement condition for the quality control of coated conductors. We will introduce the measurement systems and discuss the correlation of local critical current distributions among different magnetic field conditions.

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