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Wed-Af-Po3.18-05 [41]: Current distribution of an HTS twisted stacked-tape cable conductor investigated by self-field measurements

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Various large current-carrying conductors composed of REBCO tapes have been proposed in recent years for high current applications such as magnets and power transmissions. As one of the conductors, a twisted stacked-tape cable (TSTC) is being developed at the Massachusetts Institute of Technology. The TSTC conductor is composed of stacked REBCO tapes which are twisted along the longitudinal direction of the stacked tapes. The stacked REBCO tapes are immersed with a solder, and are imbedded in a copper former. Therefore, current transfer between REBCO tapes occurs easily when applying current in the TSTC conductor. In this study, self-field distribution measurements of the TSTC sample were conducted along the conductor in order to investigate current distribution in the conductor. A 650 mm diameter single turn coil of a 48 tape TSTC conductor made with 6 mm width SuperOx REBCO tapes was developed. The self-field measurement experiments with the sample were conducted in the test facility of the National Institute for Fusion Science. The current distribution in the TSTC conductor will be discussed by using a line current model with the measured self-fields.

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