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Measurement of AC Losses of HTS Conductors on Round Core with Filamentary Strands

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The high temperature superconducting (HTS) conductors with low AC losses are essential for the HTS power devices. There are many studies for the development of 2G HTS conductor with the low AC loss and large current capacity, such as Roebel assembled coated conductors (RACC), conductors on round core (CORC), twisted stacked tape cable (TSTC), coated conductor Rutherford cable (CCRC), and so on. Striation on the 2G coated conductor (CC) tape is considered to decrease the AC loss because the AC losses depend on the width of the tape. However the striated tape should be twisted to decrease the loss. We prepared two CC tapes with different width. One has the width of 12 mm and the other has 4 mm. Several CORC samples were fabricated with these tapes. To simulate the striation, three tapes with 4 mm width were wound on the copper core in parallel, side by side. We also made four samples with different pitches to investigate the effect of the pitch length. The test results were compared with the calculated ones for straight samples and CORC samples. The result showed the possibility of low loss HTS conductors.

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