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AC loss of HTS coils wound with various types of CORC

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AC loss reduction is essential to apply high temperature superconducting (HTS) conductors to power devices. We have studied the effect of AC loss decrease of CORC that is a low-loss and high-current conductor. The currents through CORC are equally distributed to the CORC strands (HTS tapes) because the strands are helically arranged around a cylindrical former. We have confirmed that the AC loss of CORC was reduced when we replaced a wide HTS tape with narrow tapes in parallel. In this paper, we made HTS solenoidal coils with CORC. The HTS tapes for CORC had different widths. We prepared 3 kinds of HTS stands with the same net width. The first HTS strand was 12 mm wide single tape. The second one was composed of two 6 mm HTS tapes in parallel. The third one was composed of three 4 mm HTS tapes in parallel. The net width of the second and third strands was 12 mm. In addition, we also varied the pitches of the helical winding for CORC. The AC losses were measured by electrical method. The results were compared with the calculated ones.

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