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Wed-Af-Po3.19-05 [50]: Numerical study on the coupling current and magnetization loss of striated CORC cables using 3D T-A formulation

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Striation is proved to be effective in the magnetization loss reduction for Conductor on Round Core cable. Though it was experimentally observed that the coupling loss contributed to the total magnetization loss of striated CORC cables, simulation models and detailed analysis of the coupling current were still missing. In this study, we present numerical models of striated CORC cables considering the inter-filament coupling by using 3D *T-A* formulation implemented with commercial software. To confirm the validity of our models, two sets of 4-filament REBCO tapes were prepared by laser cutting and coupled by electroplated copper and tin respectively to generate different inter-filament resistance. The magnetization loss in the frequency range of 10 Hz to 150 Hz were measured and compared against numerical results. Corresponding models of CORC cables with striated strands and inter-filament resistance were developed, where the magnetization loss behaviors and the coupling current patterns were analyzed in detail.

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