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Numerical Study on AC Loss in Quasi-Isotropic Superconducting Strand at Liquid Helium Temperatures

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The high temperature superconducting (HTS) quasi-isotropic conductor with high current capacity and quasi-isotropic performance is expected to have a wide application. AC loss is one of the major obstacles. This paper aims to study the AC loss of the quasi-isotropic conductor stacked by the second generation (2G) HTS tapes and copper tapes at 4.2 K. In order to fully understand AC loss characteristics of the stacked-tape conductor, an efficient 3D finite element method (FEM) model based on T-A formulation is adopted. This model can be adopted to handle the simulation challenges of HTS tapes with high aspect ratio and overall understand AC loss in the twisted quasi-isotropic conductor.

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