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Modelling a single-layer CORT cable with coordinate transformation

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We present a finite element model for a single-layer CORT cable composed of three coated conductors wound around a tube and carrying an AC current. We use a coordinate transformation that takes into account the helicoidal symmetry of the cable and enables the problem to be studied with an equivalent two-dimensional model. We show that this model correctly captures the full three-dimensional pattern of the current flow and allows us to calculate the AC losses as a function of the pitch angle and the length of the gap between conductors. We compare the results with a full 3D model based on the H-formulation and compare the AC losses with well-established analytical formulae.

Topic

Innovative methods and tools for modelling large-scale HTS systems

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