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2D FEM electro-magnetic modelling of straight soldered ReBCO stack cable in high magnetic field

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This work presents a 2D FEM modeling approach for a straight soldered ReBCO stack cable within Comsol Multiphysics, focusing on high magnetic field environments. The model incorporates a detailed structure of the ReBCO tapes, including properties like resistivity for the electromagnetic model, as well as the solder shell surrounding the tapes. Critical current dependence on magnetic field strength is derived from experimental data using an interpolation function, enhancing result accuracy. The study reveals specific current sharing patterns between ReBCO tapes within the soldered stack and examines how AC losses vary with external magnetic field direction.

Topic

Applications in large instruments such as high-field magnets, medical magnets and accelerator magnets

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