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Mon-Af-Po1.12-09 [16]: Analysis of AC Loss of Annular Magnet Based on 3D Model and Reduced-Dimensional Inversion

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AC loss is an unavoidable problem for a conduction-cooled HTS SMES magnet during dynamic operation, which may cause a temperature raise and affect the reliable operation of the magnet. In this paper, the 3D-model calculation method of 10MJ- annular magnet is analyzed. And then, the "Dimensionality Reduction-Inversion" method based on H-equation and homogenization modeling method is proposed, which realizes the fast calculation of AC loss of annular magnet. The accuracy and error source of the method are analyzed, which provides ideas for the calculation of AC loss of 3D superconducting magnets. In order to verify the accuracy of the "Dimension Reduction-Inversion" method, we built a small-scale annular magnet experiment platform, and measured the AC loss at 77K temperature, comparing the experimental results with the simulation results.

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