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Tue-Mo-Po2.09-05 [67]: Numerical Study on AC Loss of Quasi-isotropic Superconducting Strand in AC Magnetic Fields at Low Temperature

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Abstract—This paper mainly presents an AC loss numerical calculation of the superconducting strand in AC magnetic fields at 4.2K. Quasi-isotropic strands fabricated by second generation wires are stacked to a center symmetric structure. A 2D simulation model of strands was established based on the finite element simulation software Comsol Multiphysics from which the distribution of magnetic field is obtained. AC loss contribution, including eddy loss and hysteresis loss, were estimated in detail in AC magnitude field. The effects of the magnetic field frequency and amplitude are also particularly considered. This paper is helpful for understanding the AC losses of quasi-isotropic strands and useful for the application of high magnetic field at low temperature.

Key words—superconducting strand, cryogenic temperature, eddy loss, hysteresis loss

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