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Critical Current Analysis of a Self-shielding DC HTS Cable with a "Sandwich"Structure

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In this paper, a new configuration of self-shielding DC HTS cable with a "sandwich"structure by interleaving winding is proposed. The distributions of the magnetic field and the critical currents in traditional DC HTS cable and self-shielding DC HTS cable are analyzed and compared in detail. The simulation results show that the self-shielding DC HTS cable can minimize the outer magnetic field and raise the critical current to improve the current capacity, reduce the size of the cable and save superconducting materials. This new structure of cable has enormous prospects in industrial and marine applications where low voltage and high current are required.

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