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Thu-Af-Po.02-14: Analysis on Fault Current Characteristics of Self-shielding HTS DC Cable

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Self-shielding high-temperature superconducting (HTS) DC cables made of REBCO tapes can almost eliminate the magnetic field within the cable layers, greatly improving the uniformity of current and magnetic-field distributions. In this paper, based on the H-equation and the circuit model of the cable, the current evolutions in two self-shielding HTS DC cables made of REBCO tapes with different current directions are simulated under fault currents and their abilities to limit fault currents are also compared. Results show the HTS DC cable with the current direction of “+—+” has a larger quench resistance, and can effectively limit the rise and peak of the fault current, showing better performance in limiting the fault current.

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