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Comparison of Current Limiting Characteristics of REBCO Superconducting Wire of the Electrical Coupling Condition between Core and Coil

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Among the current limiters whose performances were proved, there are many current limiters wherein their unique electrical characteristics are combined. Of these, the SFCL that uses coil and core are combined with a superconducting current limiting element and has a unique current limiting performance. Its applicability as a SFCL was proved. Especially, the initial current limiting operating condition of the SFCL that uses the core and coil depends on the inductance according to the coil wiring direction and the turn ratio. In this study, REBCO superconducting wire, which is frequently used these days, was combined as a current limiting element of the SFCL with electromagnetic core and a coil, to analyze the quenching behavior of the current limiting element and the current limiting characteristic of the SFCL according to inductance value. Two REBCO superconducting wires were used as SFCL elements. One was a wire with stainless stabilization layer and the other was a wire with no stabilization layer. The two REBCO superconducting wires had an identical specification in terms of width, critical current and critical temperature, the values of which were 4mm, 80Arms and 90K, respectively.

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