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Design and Test of 10 kV/400 A Flux-coupling Type Superconducting Fault Current Limiting Module

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The flux-coupling type superconducting fault current limiter (FC-SFCL) is suggested to suppress the short-circuit current in the dc line of VSC-HVDC system. The FC-SFCL could generate larger inductance and smaller resistance at the beginning of current limiting process, but show smaller reactance and very large resistance at the end. One FC-SFCL module with two branches is designed and tested. For the FC-SFCL module, the two branches could use the same or different YBCO tapes. Furthermore the electromagnetic analysis and parameter calculation of the module are performed. In order to study the current-limiting performance of the FC-SFCL under the rapid change of fault current, a dynamic simulation model is established. Finally, the transient properties of FC-SFCL module under 10 ms dc impulse impact are tested.

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