



**MT 26**  
**International Conference**  
**on Magnet Technology**  
Vancouver, Canada | 2019

Contribution ID: 1419

Type: **Poster Presentation**

## **Wed-Mo-Po3.08-09 [59]: AC Loss Analysis of a 10-kV / 500-A Flux-coupling type Superconducting Fault Current Limiter**

*Wednesday 25 September 2019 09:30 (1h 45m)*

Fault current limiter (FCL) is commonly applied as a current-limiting device to improve the stability of the power system. In this paper, a Flux-coupling type Superconducting FCL (FC-SFCL) with a pair of HTS parallel windings has been developed. The limiter is based on disconnecting coupling windings for current-limiting, which has a low steady impedance at normal state and higher limiting one after fault. The problem of ac losses is fierce, which affects the thermal stability for larger leakage flux and greater fault current impulsion on the HTS windings after disconnecting. For a 10 kV / 500 A FC-SFCL prototype with windings wound on an iron-core with air gap, an improved AC losses calculation model is used to analysis the influences of different winding structures on losses and current distribution, and the scheme to reduce losses is proposed. Through adjusting the parallel numbers and arrangements of the coupling windings, their losses characteristic has significant improvements. The losses on each winding are balancing, total losses are declining, and magnetic field distributions become uniform.

**Authors:** YAN, Sinian (Huazhong University of Science and Technology, China); REN, Li (Huazhong University of Science and Technology); Dr XU, Ying (Huazhong University of Science and Technology); ZHANG, Yu (Huazhong University of Science and Technology); CAO, Zhiwei (Huazhong University of Science and Technology); SU, Rongyu (State Key Laboratory of Advanced Electromagnetic Engineering and Technology); CHEN, Guilun (Huazhong University of Science and Technology)

**Presenters:** YAN, Sinian (Huazhong University of Science and Technology, China); REN, Li (Huazhong University of Science and Technology); CHEN, Guilun (Huazhong University of Science and Technology)

**Session Classification:** Wed-Mo-Po3.08 - Current Limiters I