

Realization of a low carbon society through game changing technologies

Low-AC-Loss and Robust High-Temperature-Superconductor Technology

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Other participating R&D organizations :
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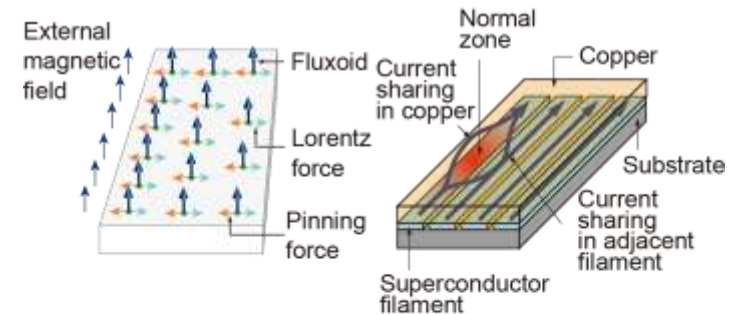
Summary :

The reduction of AC loss, which generated by fluxoid motion under AC operation, and improvement of robustness against quench are keys for the applications of coated conductor, which is a type of high temperature superconductors.

Our technical challenge is how to manage these two issues, which are not compatible with each other intrinsically.

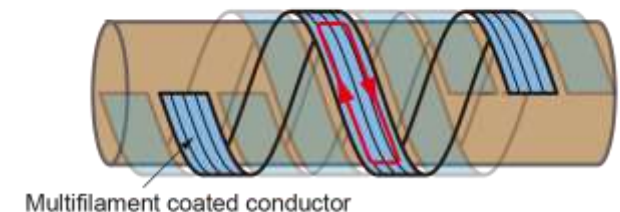
We manage both AC loss reduction and robustness improvement by the concept of SCSC cable (Spiral Copper-plated Striated Coated-conductor cable): we reduce AC loss by multifilament structure, while we improve robustness by current sharing through copper plated over superconductor filaments. The plated copper deteriorates the effect of multifilament structure for AC loss reduction, but we overcome the issue by winding multifilament coated-conductors on round core.

The developed technology will enable the realization of ultra light weight rotating machines, which are the key components for the electrical propulsion of aircraft as well as floating offshore wind turbine.



Mechanism of AC loss generation

Improving robustness by current sharing



Concept of SCSC cable