



Contribution ID: 452 Contribution code: THU-PO3-608-06

Type: Poster

## Influence of Dynamic Resistance on Current Distribution of HTS Cable Conductor for Feeder lines and Large Scale Magnet

*Thursday, 18 November 2021 10:00 (20 minutes)*

HTS cable conductor are promising with high current density and without Joule loss characterized by its intrinsic zero resistance. Therefore, HTS cable conductor with large current carrying capacity are expected to have widespread application in feeder lines large scale magnet. At present, the conventional design of HTS cable conductor, general several of 10 KA, are designed with goal of uniform current distribution by adjusting winding pitch same as AC HTS cable since the current in process of exciting and demagnetizing are alternative. Thus, AC magnetic field component generated on tapes of HTS cable conductor is non-negligible. If the AC magnetic field component is higher than its penetrated field of HTS tapes, there is inevitable dynamic resistance among them. Dynamic resistance is seldom considered in design of DC cable conductors before. The dynamic resistance significantly affects the current distribution among HTS tapes except for generating extra loss and instability. Different from conventional design method, this paper presents the design novel method of HTS cable conductor with large current capacity by considering dynamic resistance, so that the current uniformity among HTS tapes can be realized.

Keywords: Cable conductor, coated conductors, current distribution, dynamic resistance

**Primary author:** WANG, Yinshun

**Presenter:** WANG, Yinshun

**Session Classification:** THU-PO3-608 AC Loss in HTS Wires and Cables