



Contribution ID: 443

Type: **Poster**

## Wed-Af-Po.11-06: A Study on Voltage Distribution Characteristics Considering Stray Capacitance for Fusion Magnets

*Wednesday 2 July 2025 14:30 (2 hours)*

Predicting the voltage distribution of a superconducting coil has an important diagnostic purpose in relation to the maintenance of the coil. Under high-frequency conditions, the voltage distribution within a superconducting coil can become non-uniform, leading to localized high voltages may compromise the insulation between coil turns. This issue is particularly significant in systems requiring pulsed current flow conditions in superconducting coils such as plasma control and surge protection fault conditions during fast discharge. The non-uniform voltage distribution primarily arises from stray capacitance within the superconducting system. This paper investigates the voltage distribution characteristics of superconducting coils across varying frequency levels. Circuit modeling was carried out considering the KSTAR PF coils, followed by circuit analysis that accounted for stray capacitance. The results are expected to contribute to a better understanding of voltage distribution in superconducting coils and enhance the magnet's operational stability and maintenance.

**Author:** NAM, Seokho

**Co-authors:** BAEK, Geonwoo (Korea institute of Fusion Energy); KIM, Jinsub (Korea Institute of Fusion Energy); KIM, Kwang-pyo (Korea Institute of Fusion Energy)

**Presenter:** NAM, Seokho

**Session Classification:** Wed-Af-Po.11 - Modelling of Fusion Conductors and Coils I