Contribution ID: **50** Type: **not specified**

28-High Temperature Superconductors for Energy Generation

Wednesday 16 February 2022 16:10 (13 minutes)

Superconductors' properties make them very attractive for technological applications. However, standard superconductors have critical temperatures much lower than room temperature, requiring the use of expensive cryostats. High temperature superconductors (HTS) are defined for having a critical temperature above 77K, that corresponds to the boiling temperature of liquid nitrogen at atmospheric pressure. Therefore, HTS can be cooled at a much lower cost than standard superconductors. However, simulations of HTS setups are usually performed using an empirical highly non-linear relation between the electric field and the current density, that has not been explained by a consistent theory of superconductivity.
Moreover, it renders calculations numerically unstable and extremely time-consuming. The main goal of this thesis is to develop new modelling numerical tools for HTS setups. Besides being compatible with the Ginzburg-Landau theory of superconductivity, they must provide good numerical stability, be scalable and adequate to the current computational resources.

Author: MESQUITA, Maria (CeFEMA)

Presenter: MESQUITA, Maria (CeFEMA)