9th International Workshop on Numerical Modelling of High Temperature Superconductors - HTS 2024



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Recent Advances in BELFEM and Toward a Community-Driven Material Database for HTS Modeling

Tuesday, 11 June 2024 15:30 (30 minutes)

We present the latest progress within the BELFEM project, with a focus on the electromagneticthermal modeling of high-temperature superconducting cables and magnets. We discuss a recent validation and benchmark against COMSOL and GetDP, and provide a brief outlook onto current fields of research. A primary challenge encountered in the accurate modeling of such systems is the representation of material properties, which are highly nonlinear and sensitive to variations in magnetic field, temperature, and electrical current. Based on the experience made in recent investigations, we propose the development of a community-driven material database where all datasets are regularized and provided as B-Spline based lookup tables, thus offering a fast and efficient way of providing the smooth derivatives, which are highly beneficial for these nonlinear problems.

Topic

Innovative methods and tools for modelling large-scale HTS systems

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