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The role of ferromagnet to prevent the flux-jump occurrence: a numerical study

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Although thermomagnetic instability can deteriorate its performances, MgB_2 has been proved to be one of the most promising superconductors for magnetic shielding. For this reason, finding solutions to reduce or prevent thermomagnetic instabilities is mandatory. A numerical approach can be a powerful tool for predicting the occurrence of such phenomena, thus facilitating the development of superconducting devices including magnetic shields. This study focuses on the numerical analysis of the effect of the addition of a ferromagnetic layer on the mitigation of flux jump occurrence in a MgB_2 cup-shaped shield subjected to axial magnetic fields.

Keywords: magnetic shielding, thermal instabilities, numerical modelling, bulk superconductor

Topic

Coupled and uncoupled multiphysics problems

Primary authors: FRACASSO, Michela (Politecnico di Torino); Dr SOLOVYOV, Mykola (Institute of Electrical Engineering, SAS); Prof. GOZZELINO, Laura (Politecnico di Torino)

Presenter: FRACASSO, Michela (Politecnico di Torino)

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