Special Issue

Testing and Modelling of Superconducting Cables and Coils for Fusion Tokamaks

Message from the Guest Editor

The commissioning and operation of large-scale and compact fusion magnets is a complex and interdisciplinary process that involves several phases, from the initial conceptual design to the manufacturing stage and, finally, to the factory acceptance tests (FAT). During these final phases, cables and coils are tested to meet the required standards. In the initial and later phases, multi-physics numerical models—able to describe the behaviour of superconducting magnets from electromagnetic, thermohydraulic, and mechanical points of view—are applied to optimise the magnet architecture, predict coil performances during plasma operation, and prevent failures, such as quenches or mechanical breakdown. The focus of this Special Issue is the testing and modelling of both HTS and LTS cables and coils for fusion applications. Topics of interest include the following:

- Cable and coil design;
- AC loss modelling and measurements;
- Thermal–hydraulic modelling and experimental characterisation;
- Quench modelling;
- Quench protection and detection;
- Testing of cables and coils

Guest Editor

Dr. Lorenzo Cavallucci
Department of Electrical, Electronic and Information Engineering, Università di Bologna, 40126 Bologna, BO, Italy

Deadline for manuscript submissions

20 November 2025

Applied Sciences

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 5.5

mdpi.com/si/239554

Applied Sciences
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
applsci@mdpi.com

mdpi.com/journal/applsci

Applied Sciences

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 5.5

mdpi.com/journal/applsci

MDPI

About the Journal

Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal Applied Sciences has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

Prof. Dr. Giulio Nicola Cerullo
Dipartimento di Fisica, Politecnico di Milano, Piazza L. da Vinci 32, 20133 Milano, Italy

Author Benefits

Open Access:

free for readers, with article processing charges (APC) paid by authors or their institutions.

High Visibility:

indexed within Scopus, SCIE (Web of Science), Ei Compendex, Inspec, CAPlus / SciFinder, and other databases.

Journal Rank:

JCR - Q2 (Engineering, Multidisciplinary) / CiteScore - Q1 (General Engineering)