

# Complementary Analysis and Modelling on superconducting JT-60SA TFC conductor

*Tuesday, 21 September 2021 12:25 (25 minutes)*

In the framework of Cold Test Facility (CTF) at CEA Saclay, JT-60SA TF coils (TFC) were tested in nominal operating conditions (25.7 kA and 5 K) followed by experimental study and numerical modelling of the quench. An additional experimental activity was conducted in order to perform further measurements on the two TFC spares. The first aim of this test program was to allow further comprehension of supercritical helium flow behavior in a Cable-In-Conduit Conductor (CICC); the second objective was to create a large database available for developing numerical models for the CICC. The study is focused on the parameters influence and coupled phenomena like interface resistances, thermal contact between pancakes or between winding and casing, heat losses and convective heat transfer. This paper presents the main results of the experimental analyses and modelling that are conducted for different hydraulic scenarios such as the influence of the cooling mass flow rate on the conductor stability. The impact of the quench initiation, detection parameters and propagation remains a central issue that is analyzed in the case of a low current quench. The numerical simulations are performed with 1D THEA code using a local approach.

## Category

Quench experiment, simulation and analysis for all classes of LTS and HTS magnets

## Keywords

**Primary author:** KASSAB, Souha (CEA - Commissariat à l'énergie atomique et aux énergies alternatives)

**Co-authors:** Dr LOTTIN, Jean-Pierre (CEA - Commissariat à l'énergie atomique et aux énergies alternatives); Dr ABDEL MAKSOUD, Walid (CEA - Commissariat à l'énergie atomique et aux énergies alternatives); VALLCORBA, Roser (CEA - Commissariat à l'énergie atomique et aux énergies alternatives)

**Session Classification:** Quench D2