Contribution ID: **236** Type: **Poster Presentation of 1h45m**

Measurements of the Effective Thermal Conductivity of the ITER TF Coil Case Cooling System

Tuesday, 29 August 2017 13:15 (1h 45m)

The ITER magnet system contains 18 Toroidal Field (TF) coils and each TF winding pack is enclosed in a stainless steel coil case. During plasma operation, the coil case will be subjected to eddy current heating and nuclear heating, in addition to the static heat loads (thermal conduction and radiation). In order to minimize the heat transfer to the superconducting winding pack, the coil case is cooled by a flow of helium at 4.5 K circulating through an array of cooling pipes. In the baseline design, the thermal contact between the cooling pipes and the coil case is made by an epoxy bond. A series of mock-up samples has been prepared reproducing the geometry of the grooves where the coil case cooling pipes are embedded. The mock-up samples explore the ITER baseline design as well as an alternative design based on the contact between metallic surfaces. The effective thermal conductivity has been measured in the SULTAN facility by circulating a constant flow of helium at 10 bar and 4.5 K and applying a steady state heat load. The measurements show no indication of cracks or delamination decreasing significantly the overall heat conductivity of the mock-ups after cool-down, even after a 4 point-bending process representative of the assembly process.
The views and opinions expressed herein do not necessarily reflect those of the ITER Organization.

Submitters Country

Switzerland

Primary authors: SARASOLA, Xabier (EPFL); BRUZZONE, Pierluigi (EPFL-CRPP)

Presenter: SARASOLA, Xabier (EPFL)

Session Classification: Tue-Af-Po2.03

Track Classification: B1 - Superconducting Magnets for Fusion