## **CHATS on Applied Superconductivity 2017**



Contribution ID: 9 Type: not specified

## Thermal-hydraulic analysis of the HTS DEMO TF coil

Tuesday 12 December 2017 09:30 (30 minutes)

## Abstract

The new HTS design concept for the DEMO toroidal field (TF) coil, based on cross-conductor (CroCo) strands, has been proposed by KIT. The coil is layer wound and consists of 12 layers with different jacket radial thickness grades. The present work is focused on the thermal-hydraulic analysis of the conductors'design, which includes: 1) hydraulic analysis—calculation of the mass flow rates in each conductor at operating conditions during the dwell time; 2) heat removal analysis aimed at the assessment of the temperature margin at the expected nuclear heat load during the plasma burn; and 3) estimation of the maximum hot spot temperature and pressure in each conductor during quench. The analysis is performed using simplified models and the THEA code, and is aimed at verification if the proposed design fulfills the acceptance criteria.

## Acknowledgement

This work has been carried out within the framework of the EUROfusion Consortium and has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 633053. The views and opinions expressed herein do not necessarily reflect those of the European Commission. This scientific work was also partly supported by Polish Ministry of Science and Higher Education within the framework of the scientific financial resources in the year 2017 allocated for the realization of the international co-financed project.

**Primary authors:** LEWANDOWSKA, Monika (West Pomeranian University of Technology, Szczecin); Ms DEMBKOWSKA, Aleksandra (West Pomeranian University of Technology, Szczecin); HELLER, Reinhard (Karlsruhe Institute of Technology); WOLF, Michael (Karlsruhe Institute of Technology)

Presenter: LEWANDOWSKA, Monika (West Pomeranian University of Technology, Szczecin)

Session Classification: Session V