



Contribution ID: 1152

Type: **not specified**

P3.105 Investigation of hot spots development on metallic PFCs in the JET-ILW

Wednesday, 19 September 2018 11:00 (2 hours)

Plasma Facing Components (PFC) in JET with metal ITER-like wall are subjected to high heat fluxes which can lead to damages such as beryllium melting or thermal fatigue of tungsten. The hot spots formation at the re-ionization zones due to impact of the re-ionised neutrals injected by the heating system as well as due to RF-induced fast ion losses is recognized as a big threat due to quick surface temperature rise. To address this issue a real-time algorithm of automated hot spot detection called vessel thermal map (VTM) with help of Near-Infrared (NIR) protection imaging system was installed. Because these hot spots could trigger VTM alarms, which could cause the protection system to stop a pulse, it is important to identify the mechanisms and conditions responsible for the formation of hot spots.

To enable easy tracking of hot spots history and their evolution a new software tool Hotspot Editor was developed. It is based on the catalogue of hot spots in the main chamber and on divertor tiles detected during experimental campaign and is now routinely used at JET in support of the preparation of plasma pulses. As a result, the number of the VTM alarms was significantly reduced during the last campaigns. In this contribution, we will also provide an analysis of hot spot formation in relation to the diverse plasma parameter as well as conditions of possible disappearance of hot spots (e.g. after the cleaning up of tiles). We will also discuss the recommendations for avoiding or minimizing hot spots and VTM alarms.

Such a sophisticated analysis formation and development of hot spots becomes especially important during the preparation and execution of the experiments of the coming D-T campaign, where stationary plasmas with additional power of 40MW/5s and with tolerable wall heat loads and impurity concentration are required.

Presenter: HUBER, Valentina (JYlich Supercomputing Center Forschungszentrum JYlich GmbH)

Session Classification: P3