Contribution ID: **192** Type: **Poster**

ITR/P1-39: Modelling of Material Damage and High Energy Impacts on Tokamak PFCs during Transient Loads

Tuesday 9 October 2012 08:30 (4 hours)

Tungsten (divertor) and beryllium (first wall) will be the plasma-facing components used on ITER. In reactor-scale tokamaks using metallic PFCs, transient events such as ELMs, VDEs and disruptions will produce strong vaporization and surface melting. Likewise, intense heat loads due to the impact of runaway electrons (RE) generated during the current quench phase of disruptions become a major issue in devices operating at high plasma current. Even if the thermal quench energy of major disruptions is expected to be successfully dissipated by mitigation using massive gas injection (MGI), the resulting photonic radiation loads on the ITER Be wall can be very intense. Unfortunately, no existing tokamak or laboratory device can simultaneously match all the conditions of ITER transients and so estimates of expected damage to ITER PFCs can only be provided by numerical simulations, supported by benchmarking on existing experiments. This paper describes a series of applications of the codes MEMOS, ENDEP and TOKES, developed at the Karlsruhe Institute of Technology, to specific ITER transient loading on both W and Be surfaces in the case of W divertor PFC melting due to disruptions (MEMOS), RE impact on Be first wall panels (MEMOS and ENDEP) and estimates of MGI driven photon radiation flash first wall heating (TOKES). An account is also given of benchmarking studies in which these codes have been compared with results obtained on the JET and TEXTOR tokamaks.

Country or International Organization of Primary Author

Germany

Collaboration (if applicable, e.g., International Tokamak Physics Activities)

International Tokamak Physics Activities, JET, ITER

Author: Mr BAZYLEV, Boris (Germany)

Co-authors: Dr HUBER, Aleksandr (Forschungzentrum Jülich); Dr SAIBENE, Gabriella (Fusion for Energy Joint Undertaking); Dr ARNOUX, Gilles (Euratom/CCFE Association,Culham Science Centre); Dr LANDMAN, Igor (Karlsruhe Institute of Technology); Dr COENEN, Jan W. (Forschungzentrum Jülich); Dr LEHNEN, Michael (Forschungzentrum Jülich); STANGEBY, Peter C. (University of Toronto); Dr PITTS, Richard.A. (ITER Organization); Dr BREZINSEK, Sebastijan (Forschungzentrum Jülich); Dr PESTCHANYI, Sergei (Karlsruhe Institute of Technology); Dr PUTVINSKI, Sergei (ITER Organization); Dr IGITKHANOV, Yu (Karlsruhe Institute of Technology)

Presenter: Mr BAZYLEV, Boris (Germany)

Session Classification: Poster: P1

Track Classification: ITR - ITER Activities