Contribution ID: **500** Type: **Poster**

EX/P5-26: Tore Supra Contribution to Experimental Prediction of the Power Flux to the Limiter in the ITER Start-up Mode

Thursday 11 October 2012 08:30 (4 hours)

This paper reports on the experimental programme run on Tore Supra, taking advantage of its limiter plasma edge, to gain more confidence in the prediction of the power flux to the start-up limiter in ITER. A scaling law for the value of parallel power flux q// at the last closed flux surface, and its e-folding length lambda_q in the scrape-off layer is proposed in limiter configuration. It finds a different dependence on macroscopic plasma parameters than the scaling presently used for ITER tile shaping. For example, at constant power flowing into the scrape-off layer the measured lambda_q decreases with density, whereas the ITER scaling law predicts the opposite behaviour. The method that is used combines Langmuir probe, retarding field analyzer measurements, and power balance analysis. Using this method, it is found that strong secondary electron emission dominates the physics of power transmission to the wall. It results that the ion power flux is much smaller than expected, most of the power being carried by electrons. Nonetheless, the power decay length scaling found using this method is similar to standard Langmuir probe analysis because q// is dominated by the J// profile. In addition to this, for very high electron densities (up to a factor 1.4 above the Greenwald value) a steady-state highly radiating regime is observed, minimising the heat load on the limiter. This regime is investigated through a dedicated set of edge diagnostics, including Langmuir probes and spatially resolved VUV spectroscopy on the limiter.

Country or International Organization of Primary Author

CEA, IRFM

Author: Ms MONIER-GARBET, Pascale (France)

Co-authors: Dr CLAIRET, Frédéric (CEA, IRFM); Dr GUNN, James Paul (CEA, IRFM); Dr BUCALOSSI, Jérôme (CEA, IRFM); Dr COLAS, Laurent (CEA, IRFM); Dr FEDORCZAK, Nicolas (UCSD, San Diego); Dr DEVYNCK, Pascal (CEA, IRFM); Dr DEJARNAC, Renaud (Association Euratom-IPP.CR); Mr DACHICOURT, Rémi (CEA, IRFM); Dr CORRE, Yann (CEA, IRFM)

Presenter: Ms MONIER-GARBET, Pascale (France)

Session Classification: Poster: P5

Track Classification: EXD - Magnetic Confinement Experiments: Plasma–material interactions; divertors; limiters; scrape-off layer (SOL)