

Abstract Submitted
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ELM-induced W sputtering sources in JET S. BREZINSEK, FZJ, N. DEN HARDER, FOM, C. GUILLEMAUT, IPFN — JET equipped with Be wall and W divertor showed after one year of operation intact W surfaces at the target plates. Eroded W from both divertor legs contributes to the total W source and content in the plasma. Detailed analysis of the intra-ELM and inter-ELM W source in H-mode discharges has been carried out using spectroscopy of W, D and Be emission and, independently, using ECE and LP to determine respectively the ion impact energies and fluxes to the target plate. The inter-ELM W source can be eliminated in detached conditions due to impact energies below the sputtering threshold, leaving the intra-ELM source to be the dominant one (80%). Comparison between inner and outer divertor showed that both sources are comparable in the intra-ELM phase. Dedicated composition analysis reveals that sputtering by Be ions can account for the residual inter-ELM source, but cannot explain the intra-ELM source due to the low Be concentration in the plasma (1%). D+ with energies above 1keV dominate the intra-ELM W sputtering whereas in the inter-ELM phase energies of D+ are below the threshold. These energetic ions are transported from the pedestal region to the target plate during ELM excursion. The W source and content as function of the ELM frequency and ion impact energy has been studied for a set of plasmas showing initially a linear increase before decoupling due to ELM-flushing of W from the confined region sets in at about 40Hz. The range of ELM frequencies in JET covers the frequencies predicted for the ITER H-mode baseline scenarios with ELM pacing and detached inter-ELM phase. The W source in ITER will be determined by the intra-ELM phase.

S. Brezinsek
FZJ

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