

A comparison of the spatial structure of type I ELMs in ASDEX Upgrade and MAST

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Evidence for the filament structure during ELMs has been observed on a range of devices using a variety of diagnostics. New high speed high sensitivity cameras are improving the imaging capability. In this paper new results from ASDEX Upgrade obtained with such a camera will be presented and compared to those obtained on MAST. By combining these images with data from other diagnostics information can be gained on the evolution and transport of particles during the ELM.

During ITPA PEP co-ordinated experiments on MAST and ASDEX it was observed that the ELM ion saturation current e-folding length is ~ 2 cm on ASDEX Upgrade and ~ 4 cm on MAST. In order to try to determine what parameters determine the radial efflux, discharges with a range of plasmas parameters have been studied. It is found that the e-folding length on both devices shows a weak, if any, dependence on plasma parameters.

On both devices these structures have a poloidal extent of 5 - 10 cm and a typical toroidal mode number of ~ 15 . It is observed that the filaments slow in the toroidal direction and move away from the LCFS with a velocity that does not decrease with distance from the LCFS. These observations will be used to construct a model for the energy loss during an ELM. This model will be then used to predict the amount of power arriving to the divertor and the limiters which will be compared with measurements.

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