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# O2.105 Investigation of intermittent and continuous transport in the scrape-off layer of ASDEX Upgrade

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See the full abstract here http://ocs.ciemat.es/EPS2019ABS/pdf/O2.105.pdf

In magnetic confinement fusion, transport processes in the plasma edge region determine the power load onto the first wall materials which has to be minimized on the way towards a fusion power plant. While a main fraction of the power is transported parallel to the magnetic field lines to the divertor, a significant part can directly reach the plasma facing components by turbulence driven transport perpendicular to the magnetic flux surfaces. The steady state part of the particle and power flux leads to a distinct power fall-off length in the divertor. Intermittent phenomena, however, lead to an increased radial transport by convection. These phenomena are caused by plasma instabilities like edge-localized modes (ELMs) or turbulence. To investigate these steady-state as well as fast transport processes, the thermal helium beam plasma edge diagnostic at ASDEX Upgrade (AUG) is used [1]. Providing unique simultaneous measurement of electron temperature and density over a wide radial range, this diagnostic resolves ELM and inter-ELM filaments with a lifetime on the order of 10 µs, velocities of up to several km/s and a typical structure size of 5-10 mm. This contribution addresses the radial position of the origin of filaments by comparing the radially resolved portion of the convective and diffusive part of density transport. For the formed filaments which propagate into the far scrape-off-layer, the radial propagation velocity as well as their temperature and density evolution is investigated. The detected perturbations inside the last closed flux surface are correlated with Doppler reflectometry measurements. The results are compared for different confinement regimes as well as plasma scenarios, comprising L and H-mode, type-I ELMs, small ELMs and inter-ELM filaments.

References
[1] M. Griener, E. Wolfrum, M. Cavedon, et al., Rev. Sci. Instrum. 89, 10D102 (2018).

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