SOL profile and transport and relation to divertor conditions in H-Mode plasmas: a cross-machine comparison

Rationale

Since ITER is expected to operate in OSP partial detachment condition with high neutral pressure in the divertor we propose to investigate the evolution of SOL profile and transport depending on the recycling condition of the OSP and compare the results obtained in H-Mode in 3 different devices, **JET**, **AUG** and **TCV**. The investigation will be devoted in determining if **inter-ELM SOL profile broadening or shoulder** appears with similar recycling condition in all the machine, if there is a dependence on the applied power (power scan availabe on AUG), on divertor geometry (different divertor configuration at JET), puffing location (available from TCV and AUG) and if the presence of different intrinsic impurities (metallic *vs* carbon machines) make any difference. The appearence of H-Mode shoulder, **observed in all the devices** will be related to changes of fluctuation and fluctuation induced transport by considering observation at the wall (JET and TCV) or in the main SOL (TCV and AUG).

Contributors

Here listed the main contributors based on the machine. The list may change depending on the analysis and modelling

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Devices included

- JET
- AUG
- TCV

Analysis to be performed

- Target profiles and recycling condition. Availabe through Langmuir probes in all devices, Spectroscopy where available, gauges (AUG and TCV)
- Upstream SOL profiles (Thomson scattering, Li-Be, Thermal Helium Beam, Reciprocating Langmuir Probe). Determining profiles in the near and far SOL. Relate the evolution of e-folding length λ_n w.r.t the OSP recycling condition.
- Fluctuations in the main SOL using several diagnostics (GPI on AUG, Reciprocating Langmuir Probe (TCV), Thermal Helium Beam (AUG), Li-Beam (AUG))
- Radiation (Bomoletry as well as visible cameras to infer D_α radiation available in all the devices. To be confirmed the availability on TCV)
- Fluctuation in the main chamber wall through LPs on JET and TCV