

# **Investigation of fluctuations in the HDH and H\* regime of Wendelstein 7-AS**

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The High Density H-Mode Regime was discovered in Island Divertor operation of the Wendelstein 7-AS (W7-AS) stellarator. This regime is characterized by low impurity, high-energy confinement times - up to twice the value of the International Stellarator Scaling ISS95 - and edge radiated power fractions of up to 90% in detached state. Regarding the enhanced impurity transport at good energy confinement there are similarities to the enhanced  $D_\alpha$  H-mode found on the Alcator C-Mod tokamak.

In W7-AS studies were performed in order to compare the HDH regime with the classical ELM-free discharges (H\*). Although both regimes are similar in collisionality and have almost the same  $n_e(r)$ - and  $T_e(r)$ -profile shapes, the H\* regime suffers a radiation collapse due to impurity accumulation. The short impurity confinement times in HDH discharges requires enhanced transport at the plasma edge. The cause is not clear and this contribution looks for similarities to the enhanced  $D_\alpha$  H-mode of Alcator C-Mod, that is, whether quasiscoherent modes exist in W7-AS causing enhanced edge transport. Discharges with a variation of magnetic configurations, densities (up to  $4 \cdot 10^{20} \text{ m}^{-3}$ ) and powers (up to 3.2MW absorbed) will be discussed with respect to the different behaviour of fluctuations.