

Abstract Submitted
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Magnetic activity and radial electric field during I-phase in ASDEX Upgrade plasmas GREGOR BIRKENMEIER, MARCO CAVEDON, GARRARD CONWAY, PETER MANZ, THOMAS PUETTERICH, ULRICH STROTH, Max Planck Institute for Plasma Physics, Garching, ASDEX UPGRADE TEAM TEAM — At the transition from the low (L-mode) to the high (H-mode) confinement regime, so called limit-cycle oscillations (LCOs) can occur at the edge of a fusion plasma. During the LCO evolution, which is also called I-phase, the relative importance of background flows and turbulence-generated zonal flows can change, and it is still unclear whether a large contribution of zonal flows is a necessary condition for triggering the H-mode. At ASDEX Upgrade, I-phases have been studied in a wide range of parameters. The modulation of flows and gradients during I-phase is accompanied by a strong magnetic activity with a specific poloidal and toroidal structure. The magnetic activity increases during the development of an edge pedestal during I-phase, and is preceded by type-III ELM-like precursors. During all phases of the I-phase, the radial electric field E_r is found to be close to the neoclassical prediction of the electric field $E_{r,neo}$. These results suggest that zonal flows do not contribute significantly to the LCO dynamics, and the burst like behavior is reminiscent of a critical-gradient driven instability like edge localized modes. These observations on ASDEX Upgrade seem to be inconsistent with LCO models based on an interaction between zonal flows and turbulence.

Gregor Birkenmeier
Max Planck Institute for Plasma Physics, Garching

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