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EX/P1-11 · Turbulence and Transport with Spatial-temporal Biasing on the Scrape-off Layer on CASTOR Tokamak

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Abstract: Experiments with the poloidal ring of 32 plane electrodes were performed on the CASTOR tokamak (R = 0.4 m, a = 0.06 m, B = 1 T) to measure, for the first time, the complete poloidal structure of the electrostatic edge turbulence. In addition, the possibility of active modification of the edge turbulence was checked. The main results are as follows: Quite regular turbulent structures with the pronounced poloidal periodicity are observed by passive measuring signals of the individual electrodes. The dominant poloidal mode number, m = 6–8, is approximately of the same value as the edge safety factor. Propagating waves of potential (f = 10–40 kHz) with the wave numbers in the range of m = 2–8, applied to the ring of the electrodes, modify the edge turbulence significantly due to their interaction with turbulent structures.


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EX/P1-12 · The Dynamics of Locked Mode Development in the T-11M Tokamak

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Abstract: Recent results of locked mode (LM) development studies in the T-11M tokamak are submitted. A particular interest in this type of plasma MHD-activity arises from the circumstance that an appropriate plasma perturbation is quasi-stationary and potentially could destroy plasma confinement, if it exceeds the some critical level. There are evidences to believe that LM amplitude approaches this critical level in the stage preceding a major disruption, resulting in the reduction the magnetic shear in the plasma center, which finally initiates the disruption.


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EX/P1-13 · Internal Transport Barrier Triggering by Rational Magnetic Flux Surfaces in Tokamaks

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Abstract: The formation of Internal Transport Barriers (ITBs) has been experimentally associated with the presence of rational q-surfaces in both JET and ASDEX Upgrade. The triggering mechanisms are related to the occurrence of magneto-hydrodynamic (MHD) instabilities such as mode coupling or fishbone activity. These events could locally modify the poloidal velocity and increase transiently the shearing rate to values comparable to the linear growth rate of ITG modes. For reversed magnetic shear scenario, ITB emergence occurs preferentially when the minimum q reaches an integer value. In this case, transport effects localised in the vicinity of zero magnetic shear and close to rational q values may also contribute to the formation of ITBs. The role of rational q surfaces on ITB triggering stresses the importance of q profile control for advanced tokamak scenario and could contribute to lower substantially the access power to these scenarios in next step facilities.