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Wavenumber-resolved core turbulence studies in the ASDEX Upgrade tokamak and comparison with non-linear gyrokinetic simulations with the GENE code TIM HAPPEL, ALEJANDRO BAÑÓN NAVARRO, GARRARD CONWAY, TOBIAS GÖRLER, FRANK JENKO, FRANCOIS RYTER, ULRICH STROTH, Max-Planck-Institut für Plasmaphysik, Boltzmannstr. 2, 85748 Garching, Germany, THE ASDEX UPGRADE TEAM — Core plasma turbulence determines transport properties and impacts on the efficiency of a fusion reactor. Gyrokinetic codes are developed to predict dominant instabilities and the turbulence level, which causes the observed particle and heat losses. A careful validation of these codes is mandatory to improve the reliability of predictions. To this end, core turbulence is investigated in ASDEX Upgrade by means of Doppler reflectometry, which provides the perpendicular velocity of turbulent structures and their fluctuation level. H-mode discharges have been performed in which ECRH is used to drive the turbulence from the ITG turbulence regime towards the TEM regime. In general, the turbulence level increases from core towards the edge. With increasing R/L_{T_e}, core large scale structures show larger fluctuation amplitudes while their phase velocity is altered with respect to that of small structures. Results are compared with gyrokinetic simulations with the GENE code. Linear results show a transition from ITG towards TEM turbulence close to the radial ECRH deposition location. After matching of heat fluxes to results from power balance analysis, the radial trend in the turbulence level is reproduced. The response to additional heating is opposite to the experimental findings.

Tim Happel
Max-Planck-Institut für Plasmaphysik, Boltzmannstr.
2, 85748 Garching, Germany

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