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Plasma dynamics in DUSTWHEEL F. GREINER, IEAP CAU Kiel, Germany, S. KNIST, A. PIEL, IEAP CAU-Kiel, Germany — The new experiment DUSTWHEEL consists of a set of 24 water-cooled magnets, which produce a steady-state magnetic field of $\mathbf{B} \leq 0.7$T that is homogeneous over a length of L = 1 m. DUSTWHEEL has a special design for the investigation of drift or flute modes under the influence of a dusty plasma environment. In contrast to other plasma constituents dust particles are strongly affected by gravitation. To deal with this the magnets of DUSTWHEEL are suspended in a wheel-shaped cage, which allows tilting the entire experiment. In this way, the angle between the magnetic field direction and gravity can be chosen at will. This allows exciting dust flows by a variation of the residual component of gravity. The plasma in DUSTWHEEL is produced by means of a capacitive high frequency discharge at 13.56 MHz. The low density plasma has a Gaussian shaped density profile with a peak density of $4\ 10^{14}\ m^{-3}$. The electron temperature is nearly constant with a value of circa $4\ eV$. A detailed analysis of density and potential fluctuations using Langmuir probes shows a turbulent plasma state with almost no mode like behavior. As a control parameter to get different dynamic states a biasing voltage can be applied to the plasma. In this way the plasma can also be driven to mode-like states. Amplitude and structure Analysis reveals that the structures have drift wave dynamics. So, DUSTWHEEL is ready to put dust inside and study the modification of drift waves.

F. Greiner
IEAP CAU-Kiel, Germany

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