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Investigation of a Dusty Plasma in ECR Plasma ALEKSANDER DRENIK, LAPLACE and Jožef Stefan Institute, PAVEL YURYEV, AREF SLIM, FREDDY GABORIAU, RICHARD CLERGEREAUX, LAPLACE, LAPLACE - TOULOUSE TEAM, JOŽEF STEFAN INSTITUTE - LJUBLJANA TEAM — The appearance of dust in the plasma is generally considered an unwanted occurrence as the dust particles can contaminate deposited thin films, formation of dust can contribute to unwanted fuel migration in fusion reactors, etc. However, dusty plasmas can be used to create novel nanostructured materials. Formation of dust is considered to be a gas-phase process. Nonetheless, dust was observed in ECR plasmas, where due to low pressure, surface processes are strongly favored. In this experiment, the occurrence of dust in a long antennae ECR reactor was investigated. Plasma was created in pure acetylene at pressures ranging from 0.07 to 0.3 Pa. The forwarded microwave power reached up to 200 W. Dust particles were directly observed visually, indicating that the dimensions of some particles can reach well into the macroscopic scale. The curved trajectories of the particles suggest that they are confined by the magnetic field. An electrically isolated probe was used to measure the self-bias voltage of the plasma in the high magnetic field region during the experiments. The occurrence of dust was found to coincide with an increase of low frequency noise in the self-bias voltage signal and an increase of the reflected microwave power that can be related with the dust.

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