



## **Diagnostics of naturally excited waves in a dynamically active complex (dusty) plasma**

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Complex plasmas are low-pressure low-temperature plasmas containing microparticles as an additional thermodynamically active component. These particles acquire large negative charges in the plasma. Complex plasmas provide the ability to create large-scale dynamical structures of crystal-like or liquid-like ordering. The particles can be visualized individually by recording the scattered laser light with a CCD camera. The interparticle spacing is typically of the order of 0.1-1mm and the characteristic time-scales are of the order of 0.01-0.1s. These unique characteristics, plus direct imaging, allow investigations of many dynamical processes in real time at the kinetic level. Dust lattice wave (either of in-plane and out-of-plane polarizations) appears in highly ordered monolayer complex plasma and dust acoustic wave in complex plasmas with short-range ordering. The observation of the wave activity is a powerful tool to study low-frequency fluctuation spectra in a complex plasma. We report on the new advances and developments achieved with the spectral diagnostics in 2D and 3D complex plasmas. This diagnostics is a non-disturbing method which allows to measure in-vivo dynamical parameters of the plasma and the particles embedded in it.