

Abstract Submitted
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Dust confinement, voids and self-excited waves in complex plasmas under microgravity¹ M. KLINDWORTH, O. ARP, A. PIEL, Christian-Albrechts-University, D-24098 Kiel, Germany — Complex plasmas under microgravity conditions are generally affected by the void instability - a dust-free region in the center of the dust cloud. Here, we report on recent experiments on parabolic flights. The IMPF-K device is a parallel plate rf-discharge with segmented electrodes and a pair of retractable glass tubes for dust confinement. It is shown that by means of these dielectric walls void free dust clouds can be produced. The acting forces are derived from probe measurements and discharge simulations. For high dust density, large amplitude density waves are found between the void edge and the plasma boundary. These compressional waves are characterised by their frequency and wave number. The observations are completed by Langmuir probe measurements which yield the background plasma parameters. The wave phenomenon is compared with theoretical dust acoustic wave dispersion relations including the growth rate of the instability from which conclusions on the driving mechanism can be drawn.

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