

## Existence and stability of multibreathers in a dusty plasma crystal

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Recent studies of collective processes in a dust-contaminated plasma (DP) [1] have revealed the formation of strongly coupled DP crystals by highly charged dust grains, typically in the sheath region above a horizontal negatively biased electrode in experiments [1, 2]. Typical low-frequency oscillations are known to occur [2] in these mesoscopic dust grain quasi-lattices in the longitudinal (in-plane, acoustic mode), horizontal transverse (in-plane) and vertical transverse (off-plane, inverse dispersive optic-like mode) directions.

A (quasi) one-dimensional DP crystal is considered. The transverse motion in this system is described by a Klein-Gordon like Hamiltonian with a quartic potential. Provided the potential (nonlinearity) constants by experiments [3] and using the results of [4, 5, 6], we prove that this system can support multi-site localised oscillations (multibreathers) [7].

This system provides a macroscopic way in order to experimentally check our theoretical predictions. The present work will be generalised in two dimensional crystals which are spontaneously organised in a triangular lattice.

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