

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Mode spectra and mode conversion of dust particle clusters in complex plasmas QIAO KE, TRUELL HYDE, LORIN MATTHEWS, JIE KONG, ANGELA DOUGLASS, ZHUANHAO ZHANG, CASPER, Baylor University — Vibrational mode spectra are obtained for small ($2 \leq N < 10$) dust particle clusters in complex plasmas using both an analytical method and numerical simulation. The clusters are modeled as dust particles levitated in the sheath above the lower electrode in a GEC rf reference cell. Both the wake field effect and height-dependent charge variation are taken into account. Dependence of mode frequencies on the wake field and charge variation is analyzed. Mode conversions occur as the frequencies of different modes approach each other. These mode conversions are identified and experimental measurements of the modes and conversions are compared with the analysis of theoretical results.

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Date submitted: 14 Jul 2010

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