



One-dimensional vertical dust strings in a glass box

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(Submitted on 11 Jul 2011)

The oscillation spectrum of a one-dimensional vertical dust string formed inside a glass box on top of the lower electrode in a GEC reference cell was studied. A mechanism for creating a single vertical dust string is described. It is shown that the oscillation amplitudes, resonance frequencies, damping coefficients, and oscillation phases of the dust particles separate into two distinct groups. One group exhibits low damping coefficients, increasing amplitudes and decreasing resonance frequencies for dust particles closer to the lower electrode. The other group shows high damping coefficients but anomalous resonance frequencies and amplitudes. At low oscillation frequencies, the two groups are also separated by a $\{\pi\}$ -phase difference. One possible cause for the difference in behavior between the two groups is discussed.

Subjects: **Plasma Physics (physics.plasm-ph)**
Report number: CASPER-11-06
Cite as: **arXiv:1107.2074 [physics.plasm-ph]**
(or **arXiv:1107.2074v1 [physics.plasm-ph]** for this version)

Submission history

From: Sherri Honza [[view email](#)]
[v1] Mon, 11 Jul 2011 16:44:20 GMT (766kb)

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