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The Relationship Between the Sloshing and Breathing Frequencies in a 1D Vertically Aligned Dust Particle Chain JIE KONG, KE QIAO, HANNAH SABO, LORIN MATTHEWS, TRUELL HYDE, CASPER - Baylor University — When confined in a glass box placed on the lower powered electrode of a GEC rf reference cell, dust particles immersed in plasma can form vertically aligned 1D chains. Both the formation and subsequent structural changes within this vertically aligned dust chain are controlled by the rf power, since the rf power effects the ionization rate in the cell, the screening parameter and the charge on the dust particles. In this study, oscillations of a 1D vertically aligned dust particle chain are employed to investigate the dust charge and screening length through measurement of the resonance frequency. It will be shown that the relationship between the sloshing and breathing frequencies indicates that the ion streaming effect plays an important role in vertical oscillations and must be included in any structural analysis of the system.

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