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Dust Particle Pair Correlation Functions and the Coupling Parameter of a Vertical Dust Chain . JIE KONG, KE QIAO, LORIN MATTHEWS, TRUELL HYDE, Baylor University — Dust kinetic energy is a measure of the stochastic motion of a dust particle and is a result of the combination of the Brownian motion and the fluctuations in the dust charge and confining electric field. The coupling parameter Γ, which is defined as the ratio of the interparticle Coulomb energy to the kinetic energy, can be used to predict phase transitions of the dust crystal structure. This talk will describe the relationship between the dust kinetic energy derived from the mean square displacement technique and a technique using the probability distribution of the displacements obtained from random fluctuations of the dust particle. A structural transition from 1D vertical dust chain to 2D or 3D in a glass box, the coupling parameter change can be investigated by measuring the dust kinetic energy and the Coulomb energy.

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