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Complex Plasmas with Two Distinct Particle Sizes BERNARD SMITH, LORIN MATTHEWS, TRUELL HYDE, CASPER - Baylor University — Dust particle clouds are found in most plasma processing environments and many astrophysical environments. Dust particles suspended within such plasmas often acquire an electric charge from collisions with free electrons in the plasma. Depending upon the ratio of interparticle potential energy to average kinetic energy, charged dust particles can form a gaseous, liquid or crystalline structure with short to longer range ordering. The majority of past and current experiments employed monodisperse spheres to form their complex plasma system. As a result, the manner in which the basic thermodynamic properties of the system are dependent upon the overall dust grain size distribution is still not well understood. In this experiment, two-dimensional plasma crystals were formed from mixtures of 11.93 μm , 8.89 μm and 6.50 μm monodisperse particles in Argon plasma. The pair correlation function and vibrational data were determined for varying pressures and powers and then compared with measurements obtained for experiments employing a single size distribution of monodisperse spheres.

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