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Structural Phases in Complex Plasmas TRUELL HYDE, KE QIAO, JIE KONG, LORIN MATTHEWS, JORGE CARMONA, JERRY REAY, MIKE COOK, JIMMY SCHMOKE, CASPER - Baylor University — Dust particles imbedded within plasma acquire a charge from collisions with free electrons and ions in the plasma. If the ratio of the inter-particle potential energy to the average kinetic energy is sufficient, the particles form a "liquid" structure with short range ordering or a crystalline structure with longer range ordering. When the dust particles form a crystalline structure and reside within two-dimensionally extended lattice planes, different stable crystalline phases have been observed experimentally. Recently, it has been found that energetically favored structures can be formed employing various external DC biases. Additionally, dust free region formation employing this form of external DC bias will also be discussed. Experimental results will be shown to be in good agreement with current theoretical predictions for a strongly coupled complex plasma system.

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