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Structuring in a dynamically driven complex (dusty) plasma

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A complex (dusty) plasma consists of a weakly ionized gas and small solid particles. In experimental investigations of complex plasma dynamics and self-organization the particle size is usually of a micron to some tens of microns. In dc and rf complex plasmas used for those studies the particles are negatively charged. The internal structure of the particle cloud is determined by the mutual particle-particle interactions consisting of isotropic and anisotropic forces, as recent detailed studies demonstrated. This delicate interplay of isotropic and anisotropic forces gives rise to different competing symmetries, patterns, and the phase transitions. Self-organization through the formation of dust striations in the form of chains have been observed for the first time in sparks. Structuring through the formation of strings, filaments, and patterns (lattices) formed by the interacting strings is one of the basic processes in many systems as diverse as electrons on superfluid helium, current-carrying plasmas, superconductors, laser pulse filamentation in various transparent media, and colloids. We report on dynamically driven microparticle clusters with a well-developed string structure that have been recently observed in an rf and dc complex plasma.