

Abstract Submitted
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Energy Dissipation at the onset of polarity switching in the PK-4 experiment¹ ZACHARY HOWE, JEREMIAH WILLIAMS, Wittenberg University, LORI SCOTT, UWE KONOPKA, EDWARD THOMAS, JR., Auburn University, MICHAEL KRETSCHMER, MARKUS THOMA, Justus-Liebig-Universität Gießen, MIKHAIL PUSTYLNİK, HUBERTUS THOMAS, German Aerospace Center — The behavior of micron-sized particles (dust) in a plasma system is of great interest and, because of the low charge to mass ratio of these particles, the dynamic time scales of the dust grains are long and easily accessible from an experimental perspective. However, the high mass leads to sedimentation effects in ground-based experiments. To reduce sedimentation effects, it is necessary to perform experiments in a free-fall (microgravity) environment, such as in the experiment facility Plasma-Kristall-4 (PK-4) on parabolic flights, where the effects of gravity are reduced. In the PK-4 facility, particles are injected into a dc glow discharge plasma and flow along an axial electric field. Upon the application of a periodic oscillation of the electric field (polarity switching), a sudden change in the bulk motion of the dust and a redistribution of kinetic energy of the dust particles can be observed. This poster will present the results of a study comparing this distribution of energy on the macroscopic level and the microscopic level in ground-based and parabolic flight experiments at the onset of polarity switching.

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