Abstract Submitted
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Oscillatory Particle Motion in Dusty Plasma under Microgravity Conditions[1] JOHN GOREE, BIN LIU, Univ. of Iowa, V.E. FORTOV, A.M. LIPAEV, V.I. MOLOTKOV, O. PETROV, JIHT, Russian Acad. of Sciences, 125412 Moscow, Russia, G.E. MORFILL, H.M. THOMAS, R. ROTHERMEL, A. IVLEV, Max-Planck-Institut für Extraterrestrische Physik, Garching, Germany — In an experiment aboard the International Space Station, performed using the PK-3 Plus instrument, 6.8-micron diameter polymer microspheres were introduced into a neon RF discharge at 0.2 Torr. The microspheres became highly charged in this dusty plasma. Microspheres were tracked by video micrography. The suspension had a void, and on one side there was only a single layer of microparticles. The random motion in this single layer was analyzed by spectral analysis methods, revealing the presence of oscillations. Microspheres oscillate about equilibrium positions determined by confining forces. The transverse, or out-of-plane, motion had a resonance frequency that allows us to compute a force constant $k = 2 \times 10^{-10}$ Nm^{-1} for the radial confining forces. These forces, QE and ion drag, are equal and opposite. Their magnitudes correspond to an acceleration in the range $0.2 - 0.4g$

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