

Abstract Submitted  
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**Observation of frequency cutoff for self-excited dust acoustic waves**<sup>1</sup> V. NOSENKO, S.K. ZHDANOV, G.E. MORFILL, Max-Planck Institute for extraterrestrial Physics, S.-H. KIM, J. HEINRICH, R.L. MERLINO, Department of Physics and Astronomy, Univ. of Iowa, Iowa City Iowa 52242 — Complex (dusty) plasmas consist of fine solid particles suspended in a weakly ionized gas. Complex plasmas are excellent model systems to study wave phenomena down to the level of individual “atoms”. Spontaneously excited dust acoustic waves were observed with high temporal resolution in a suspension of micron-size kaolin particles in a dc discharge in argon. Wave activity was found at frequencies as high as 400 Hz. At high wave numbers, the wave dispersion relation was acoustic-like (frequency proportional to wave number). At low wave numbers, the wave frequency did not tend to zero, but reached a cutoff frequency  $f_c$  instead. The value of  $f_c$  declined with distance from the anode. We propose a simple model that explains the observed cutoff by particle confinement in plasma. The existence of a cutoff frequency is very important for the propagation of waves: the waves excited above  $f_c$  are propagating, and those below  $f_c$  are evanescent.

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V. Nosenko  
Max-Planck Institute for Extraterrestrial Physics

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