Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Effects of rotational frequency on the growth rate of dust ion-acoustic wave in a complex plasma MYOUNG-JAE LEE, Department of Physics, Hanyang University — Dust particles in a plasma are created in various situations, such as in dc discharges, rf discharges, laser-driven plasmas, and processing plasmas used in device fabrications, and in space, such as in interstellar clouds and solar systems. In general, a large number of background electrons can stick onto the surface of dust particles during the charging processes, and as a result, a significant depletion of the electron number density can occur. If the shape of charged dust particles is non-spherical, they can rotate due to the interaction with the surrounding plasmas or oscillating electric field. Therefore, a significant modification of the conventional plasma wave dispersion relations may be necessary for the complex. In this work, the growth of a dust ion-acoustic wave is investigated in the presence of the rotating dust particles in a superthermal plasma. The full spectra of the growth rate of the dust ion-acoustic wave are obtained and analyzed. The growth rate is found to be enhanced by the rotation frequency but suppressed as the number of plasma in the high-energy tail is increased.

Myoung-Jae Lee
Department of Physics, Hanyang University

Date submitted: 11 Jun 2010 Electronic form version 1.4