MSS-Seminar

Thursday, Sept. 6th, 15:30, Nägelsbachstr. 49b

Vibro-fluidized granular gas in Microgravity

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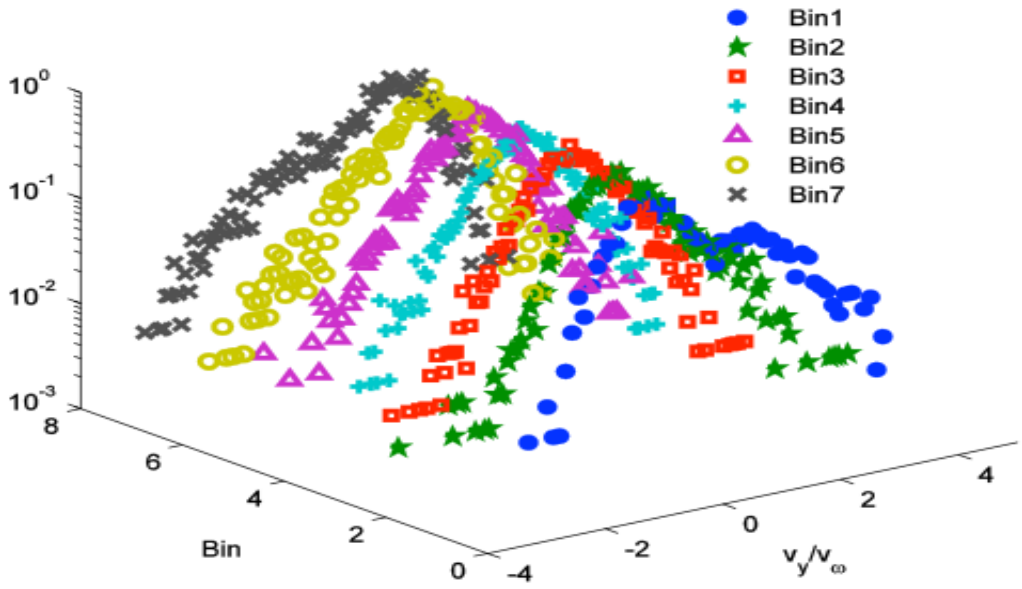

Experimental study of intermediate number density vibro-fluidized inelastic spheres in a rectangular container is performed in Airbus of Novespace (2006 CNES Campaign)[1]. Local velocity distributions are investigated, and are found to deviate measurably from a symmetric distribution for the velocity component of the vibrating direction when dividing particles along the vibration direction into several bins (see figure below). This feature does not exist in the molecular gas. We further study the hydrodynamic profiles of pressures p and temperatures T in positive and negative components, such as p+(y) and p-(y), and T+(y) and T-(y), in accordance with the sign of velocity components of the vibrating direction. Along vibration direction, granular media are found to be not only inhomogeneous and anisotropic, but also different greatly in positive and negative components. Energy equipartition breaks down in this case[2]. A hydrodynamic understanding of the situation is presented[3].

[1]Y.P. Chen, P. Evesque, M.Y. Hou, C. Lecoutre, F. Palencia, Y. Garrabos, J. Phys.: Conf. Ser.327, 012033 (2011).
[2]Y.P. Chen, P. Evesque, M.Y. Hou, Chin. Phys. Lett. 29, 7, 074501 (2012).
[3]Y.P. Chen, M.Y. Hou, Y.M. Jiang, M. Liu, Submitted to Phys. Rev. Lett.