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Particle kinematics in a 3-dimensional vibration-fluidized granular medium[1] HONG-QIANG WANG, NARAYANAN MENON, University of Massachusetts Amherst — We report a study by high speed video imaging of particle motions in the bulk of a three dimensional granular gas. We fluidise with intense vertical vibration, delrin spheres of diameter, d=1.6 mm confined in a 3-dimensional volume $(32d)^3$. We isolate particles moving in a thin slice of this volume by illuminating with a laser sheet. We have developed a new algorithm to track with sub-pixel precision particles that are only partially illuminated or eclipsed by other particles. We will present data in the low-volume fraction regime for spatial profiles of the the kinetic temperature and number density, as well as for the velocity distribution. These results will be compared to predictions from hydrodynamic models.

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