Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

On the periodic motion of a disk falling freely in a tube NICOLAS BROSSE, PATRICIA ERN, Institut de Mecanique des Fluides de Toulouse, France — Freely falling or rising particles in an unconfined low-viscosity fluid otherwise at rest are known to exhibit oscillatory motions, such as helicoidal or zigzag paths. In this work, we characterized experimentally the oscillatory motions of disks falling in a tube at Reynolds numbers $60 < Re < 250$, covering both rectilinear and periodic motions. The fall of the bodies (of density close to that of the fluid) was followed by two travelling cameras to determine the body's translation and rotation characteristics. We focused on the effect of the confinement factor (ratio of the diameter of the body, d, to that of the tube, D). The study was carried on for different body's aspect ratio (ratio of its diameter d to thickness h, taken as 3, 6 and 10), since this parameter is known to strongly influence the characteristics of the oscillatory motions observed in the unconfined situation.

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Date submitted: 21 Jul 2010 Electronic form version 1.4