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Falling dynamics of saddle-like particles. LUIS BLAY ESTEBAN, JOHN SHRIMPTON, BHARATHRAM GANAPATHISUBRAMANI, University of Southampton — Irregular particles freely falling under the effect of gravity through a viscous media describe various falling styles depending on the fluid and particle properties. Understanding the differences in dynamics between falling styles is relevant to many branches of science and engineering.Thin disks and rectangular plates have been widely investigated in the past and its motion has been classified under four different trajectory types: steady descent, fluttering, tumbling and chaotic. The type oftrajectory depends on the Reynolds number of the particle (Re) and dimensionless particle inertia (I*). However, when these geometry of theparticles are modified, the regime map issignificantly altered. In this study, we carry out experiments with thin plates that have a square planform of different diagonal lengths (d) and different curvatures at the centre of the plate. The aim to investigate the effect of the bending angle on the particle dynamics and the regime map. Thesedifferentparticles are released in to quiescent fluid with similar initial conditions using a mechanism that employs active suction. Each particle was dropped multiple times from a height (h) sufficiently large (h/d >>1) to allow the falling regime to fully develop during the observation. Particle falling trajectories were recorded with two high speed cameras at 60 frames per second so that the particle dynamics are temporally resolved during all parts of the particle descent. Results from the analysis of these trajectories and theresulting regime map for the plates with varyingcurvature will be presented.

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