Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

**The effect of shape and shedding on the dynamics of the pendulum.** MARTIN OBLIGADO, Laboratoire des Ecoulements Geophysiques et Industriels, MARTIN GONZALEZ RAMIREZ, CHRISTOS VASSILICOS, Imperial College London — The simple pendulum is a paradigm for many problems in physics (oscillators, resonances, instabilities, dissipative systems, etc.). A recent study (Obligado et al, JFM, 2013) performed an experimental investigation of the influence of the turbulence level on the aerodynamic forces acting on a circular plate facing a mean stream by measuring the equilibrium position of the plate when it is mounted on a pendulum capable of moving in the streamwise direction. It was found that the equilibrium of a pendular disk facing a flow exhibits bi-stability and hysteresis, caused by the well known mechanism of detachment/reattachment of the boundary layer of the blob. In this work we propose a systematic study of the influence of the geometry of the pendulum blob on this behaviour and some characterisation of the turbulent wake it generates. Pendulum blobs with regular peripheries (such as squares, triangles and disks) and with fractal/irregular peripheries (as used in Nedic et al, Fluid Dyn Res, 2013) are studied. We find that all the plates with irregular/fractal peripheries present smooth mean angle profiles and low, constant fluctuations for all positions tested in these experiments. Irregular/fractal peripheries therefore inhibit the reattachment mechanism.

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Date submitted: 29 Jul 2017 Electronic form version 1.4