Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

**Universality of Bubble-Jets in Gravitational Fields**[1] DANAIL OBRESCHKOW, MARC TINGUELY, NICOLAS DORSAZ, PHILIPPE KOBEL, AURELE DE BOSSET, MOHAMED FARHAT, Ecole Polytechnique Federale de Lausanne — Gravity matters: for us, as well as for small vapor bubbles in liquids. When cavitation bubbles collapse, they feel the presence of a faint hydrostatic pressure gradient caused by gravity – an effect, which is widely neglected for the experimental difficulty of uncovering the weak action of gravity. We faced this challenge by designing an experiment able to generate uniquely spherical cavitation bubbles. Captivating high-speed movies showing the collapse of those bubbles manifest beautiful jets caused solely by gravity. These jets were studied systematically by running the experiment aboard an acrobatic aircraft (52nd ESA parabolic flight campaign), able to simulate the gravitational fields of the smallest moons and the largest planets in the solar system. The data reveals a clear connection between the size of the jets and the level of gravity. Further reduction and theoretical developments led to a universal scaling law between the size of jets emitted by cavitation bubbles and a single parameter, which only depends on the pressure field and the bubble volume.

[1]SNSF Grant 200020-116641

Mohamed Farhat
Ecole Polytechnique Federale de Lausanne

Date submitted: 12 Aug 2011 Electronic form version 1.4