Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

An Experimental Study of Turbulent Vortex Rings[1] LIAN GAN, Department of Engineering, University of Cambridge — Vortex rings in this laboratorial study is generated by pushing a piston through a tube with an orifice opening in water environment. In this paper, turbulent vortex rings upon formation was studied. Turbulence is produced by increasing the Reynolds number (based on slug model) and the piston stroke length over critical values, the vortex ring is then highly excited. Up to date, the only systematic study of turbulent vortex rings is by means of Laser Doppler Velocimeter (LDV), which can only give velocities at one point. The entire ring structure has to be visualized by some statistical treatments which maybe smear out some important physics inside a single turbulent vortex ring and can include errors because of dispersion. In this paper, turbulent vortex rings are studied by means of Stereoscopic Particle Image Velocimetry (PIV), which is able to give three-dimensional velocity field on the entire plan of interest and to overcome the disadvantages of LDV mentioned above.

[1]University of Cambridge

Lian Gan
Department of Engineering, University of Cambridge

Date submitted: 07 Aug 2008 Electronic form version 1.4