

## Optical Group Student Travel Grant Report

12<sup>th</sup> International Symposium on Applications of Laser Techniques to Fluid  
Mechanics

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Tom Charrett

Optical Sensors Group, Centre for Photonics and Optical Engineering,  
Cranfield University, Cranfield, MK43 0AL

<http://www.cranfield.ac.uk/soe/cpoe/>

The international symposium on applications of laser techniques to fluid mechanics was held at the Calouste Gulbenkian Foundation, in Lisbon and is the twelfth in series running since 1982. The symposia aim to contribute to the presentation of new research on advanced techniques for flow measurement and results of significance to fluid mechanics, with an emphasis on the application of laser techniques to scientific and engineering investigations of fluid flow. This year's symposium was also an informal celebration of 40 years of Laser Doppler Anemometry (LDA) and 20 years of particle image Velocimetry (PIV) which were the subjects for the opening talks.

The program consisted of 33 sessions with a total of one 182 contributed talks spread over 4 days, so as there were a large number of parallel sessions it was necessary to plan my time at the conference carefully, so as to attend those of presentations of particular interest to me. My main objectives from attending the conference were to present my paper, entitled 'Two-frequency Planar Doppler Velocimetry', find out about the latest work in Planar Doppler Velocimetry (PDV) by other groups and to meet some of the prominent researchers in field. Also the conference is a good place to learn about the latest developments in other flow measurements techniques, and other techniques that might have similar problems and issues to those with PDV.

My paper 'Two-frequency Planar Doppler Velocimetry' describes a modification of the normal PDV technique, where a reference image is no longer acquired on a second CCD camera alongside the signal CCD camera. The reference image is now acquired immediately before the signal image, but on the same CCD camera, this is achieved through the use of two different frequencies of illuminating laser light.

I presented my paper in the Doppler Velocimetry-2 session on the third day of the conference, and was pleased with the way it went, with some interesting questions after the talk. Especially useful was a discussion with James Meyers, from NASA Langley research centre, about several possible issues with the modified technique, after the session was over. There were also presentations by several other groups working on PDV, and those involved but not presenting were also present at the session, providing an opportunity to meet and talk to many of them.

I also attended many interesting presentations on varying subjects, of particular interest was the novel measurements techniques session, and a talk on a new measurement technique called multi-point laser Doppler anemometry (MPLDA), which uses a similar principle to PDV, in that it measures the Doppler shift of scattered light although in linear profiles across the flow rather than a plane.

Other presentations of particular interest included one about 'the delivery of high peak power light pulses through hollow waveguide fibres' which could be of use in my future work on the two-frequency PDV technique.