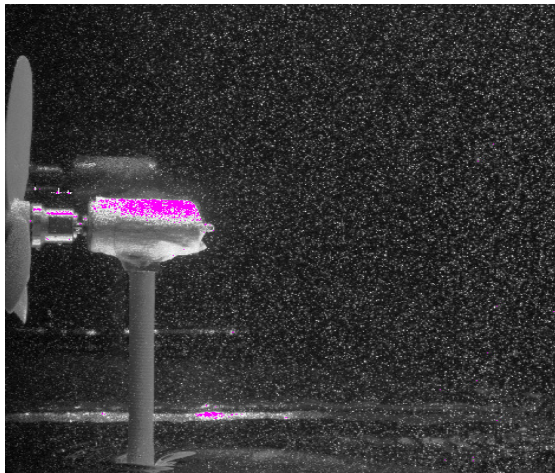


Product Information

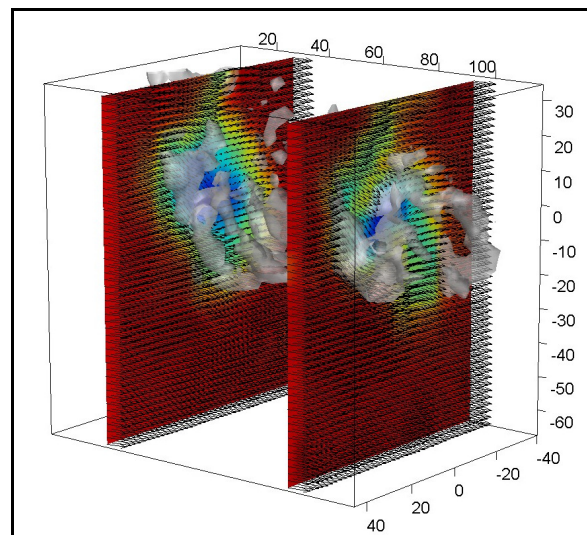
Wake flow of wind turbine measured by V3V

The flow generated by wind turbines in a wind farm can have significant effect in wind and temperature distribution to communities located downstream of the wind farm. In addition, the wake from a turbine may affect the flow of another turbine downstream. Typically the flow distribution in a wind farm is very complex, dependent upon the number and the distribution of the turbines. To understand this complex flow, it is useful to investigate the flow from a single turbine. The V3V system was employed to measure the flow distribution in the volume behind one turbine.

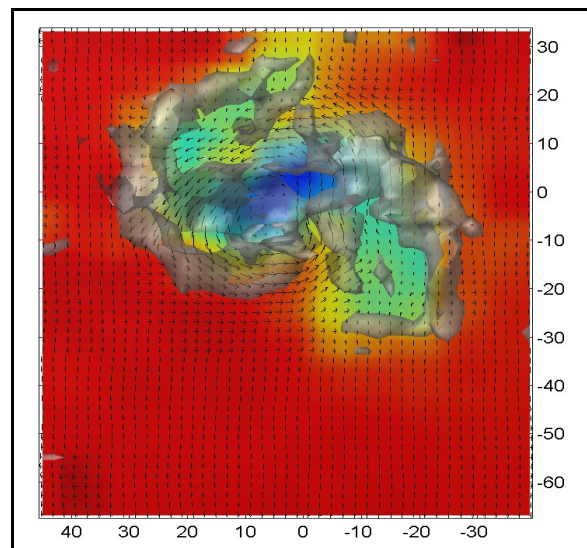


The turbine was placed in a water tunnel and was driven by the water stream flowing across the blades. A picture of the turbine in the tunnel is displayed above. The measurement volume was 80 by 100 by 120 mm³ and Polycrystalline with a mean diameter of 50 μm was used as seed particles. A 200 mJ Nd:YAG laser was used to provide the volumetric illumination. Measurements were taken with different speeds of water stream in the tunnel, driving the turbine at different speeds. A typical plot of the iso-

surfaces of vorticity magnitude and the velocity vectors is given below. The rotational flow pattern and the tip vortices generated from the turbine are easily observed from the plot. The plot of two streams of the tip vortices generated from the blades is given below.



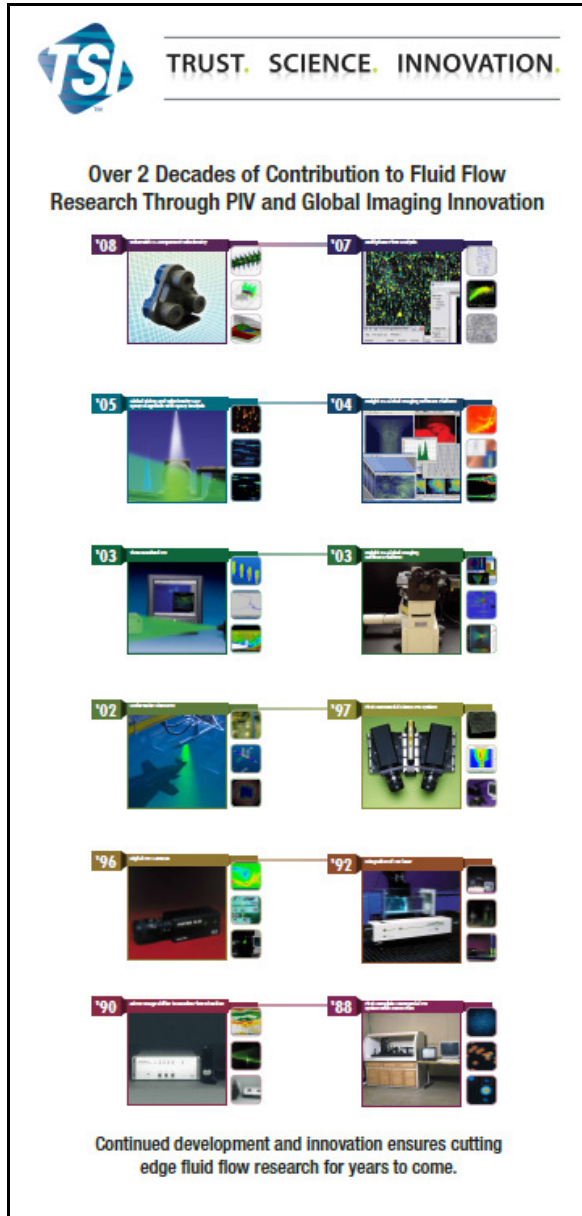
Plot of Velocity vectors and Vorticity surfaces



Plot of tip vortices generated from blades

New Product Brochure

A banner stand titled “Over 2 decades of Contribution to Fluid Flow Research through PIV and Global Imaging” was designed for the 25th Year PIV conference in Germany. A brochure with the same theme is being designed.



TSI TRUST. SCIENCE. INNOVATION.

Over 2 Decades of Contribution to Fluid Flow Research Through PIV and Global Imaging Innovation

'08 '07

'05 '04

'03 '03

'02 '97

'96 '92

'90 '88

Continued development and innovation ensures cutting edge fluid flow research for years to come.

New Cameras and Lasers for TR-PIV products

Photron high speed cameras with the following models and specifications

Model	Description
630076-2GB	Photron SA3,2GB,1k by 1k,1000fps
630076-4GB	Photron SA3,4GB,1k by 1k,1000fps
630076-8GB	Photron SA3,8GB,1k by 1k,1000fps
630077-2GB	Photron SA3,2GB,1k by 1k,2000fps
630077-4GB	Photron SA3,4GB,1k by 1k,2000fps
630077-8GB	Photron SA3,8GB,1k by 1k,2000fps
630078-8GB	Photron SA1,8GB,1k by 1k,5400fps
630078-16GB	Photron SA1,16GB,1k by 1k,5400fps
630078-32GB	Photron SA1,32GB,1k by 1k,5400fps

Standard and High Speed Litron lasers

Litron Model	Frequency (Hz)	Energy Output (mJ)
Nano S and L series	15 to 30	30, 50, 65, 135, 120, 200
Nano TRL series	15	250, 325, 400, 425
Nano L series	50 or 100	50, 100
LDY series	1000	10, 15, 20, 22.5, 30

Upcoming Seminars

V3V seminar in Berlin, Germany (Oct. 20th)

V3V seminar with INSEAN in Rome, Italy (Dec. 8th)

TSI Tour during the APS

We are organizing a TSI Tour during the APS (Division of Fluid Dynamics) meeting to be held in Mpls on November 23rd, 2009. Please ask your customers to sign up for the Tour.

http://www.tsi.com/en-1033/2009_TSI_APS_TOUR.aspx

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