

MEASUREMENTS IN A LARGE CHAMBER

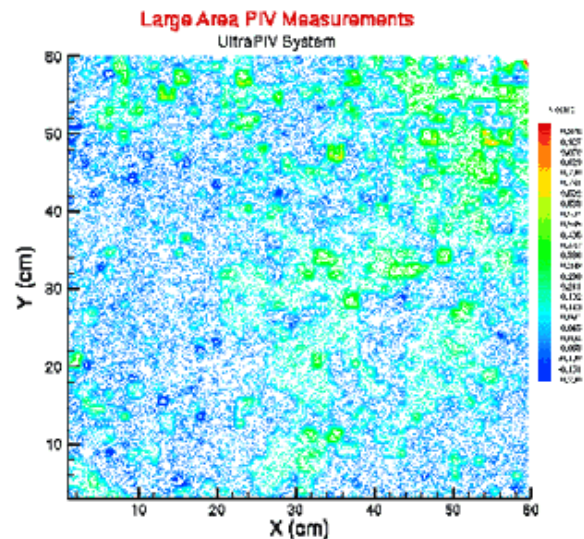
APPLICATION NOTE PIV-005

A large chamber with a test section of 62×62 cm was used for the air flow measurements. The flow was seeded using oil droplets. The flow here represented the large-scale convective motion in a chamber. The test section was illuminated using a light sheet and a 60×60 -cm region of the flow field was imaged.

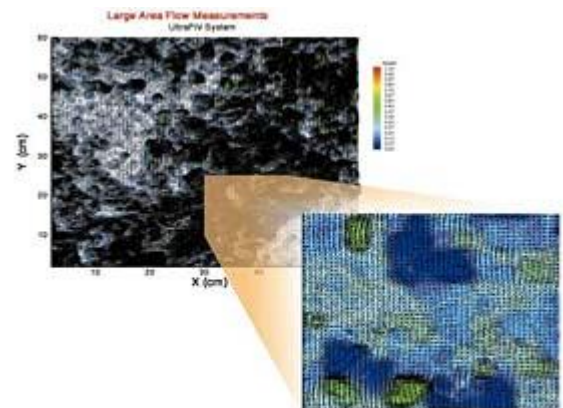
A 120-mJ mini-YAG laser system with light arm and light sheet optics was used to generate a light sheet in the vertical plane to illuminate the flow. A PIVCAM 10-30 camera was used to capture the images. INSIGHT Ultra Data Analysis Package provided system control, image capture, data analysis and display. UltraPIV measurements in a region 60 -cm \times 60 cm are shown in the figure.

Because of the very large number of vectors, for purposes of clarity, 1/16th of the measured flow field is shown enlarged. The ability of the UltraPIV system to identify the presence of small structures and their influence on flow properties can be seen.

Other flow properties such as vorticity and strain rates were also obtained from these vector fields. In addition, frame-straddled images were captured at the maximum frame rate of the cameras to get time-averaged properties of the flow. Animation of the vector field as well as the flow properties give a clear insight into the dynamics and development of the flow.



Vertical component of velocity





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