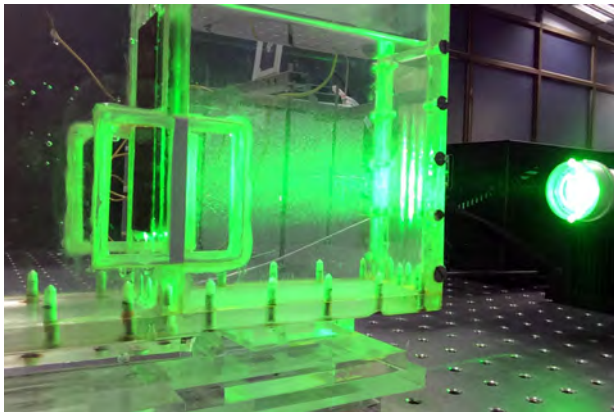
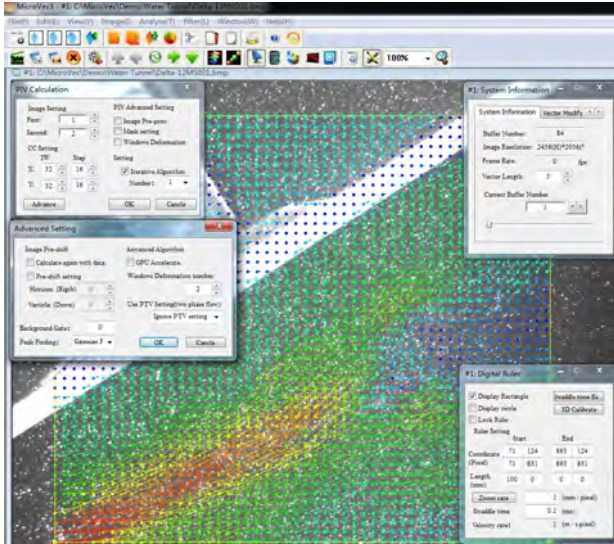
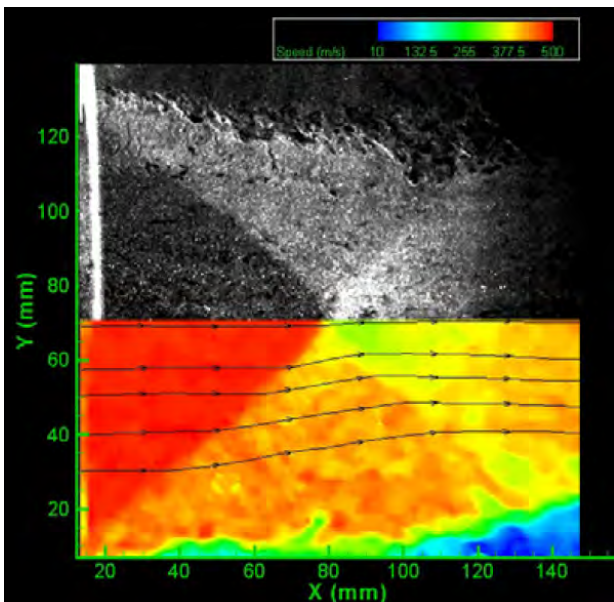


MicroVec PIV Overview

Versatile PIV solutions by exploiting state of art research



Software integrated with some of the world's leading hardware manufacturers



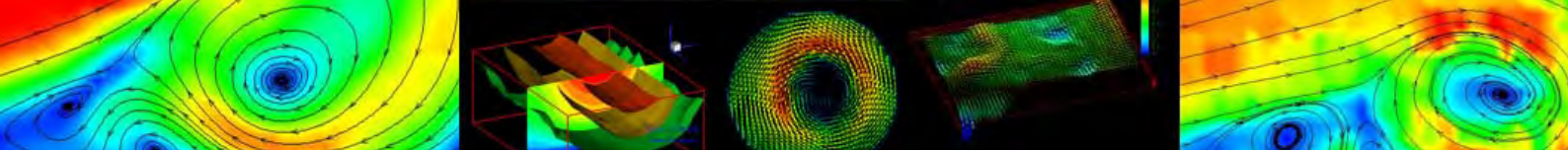
MICROVEC Pte. Ltd. possesses over 15 years of experience of offering a complete range of Particle Image Velocimetry (PIV) solutions/systems. The company has been developing proprietary PIV Technology and based on the latest research in the field, it has been constantly implementing and improving new analysis methods/algorithms. Microvec has teamed up with some of the leading researchers worldwide to gain access to the most advanced and innovative research and exploit their research outcomes as input to Microvec's products.

Microvec proprietary PIV software and PIV systems include:

- 2D PIV, 3D (Stereo) PIV, Time Resolved (TR) PIV, Micro PIV
- Tomographic PIV with 4 different MART algorithms including one of the most advanced Intensity Enhanced MART algorithms.
- Particle Tracking Velocimetry (PTV) included with 2D and 3D PIV software
- Graphic Processing Unit (GPU) support for faster calculations and use of parallel processing included in all software modules
- Proper Orthogonal Decomposition (POD) and Dynamic Mode Decomposition (DMD) modules
- Pressure PIV, introduced in 2014 was world's first commercial PIV software capable of instantaneous pressure reconstruction
- Light Field PIV introduces in 2017 offering volumetric PIV measurements with an easy setting with only one camera
- Single Pixel PIV to be introduced in 2018; world's first commercial implementation of Single Pixel Ensemble Correlation (SPEC), an algorithm used for stagnant flows in microchannels or boundary layers
- Tomographic Pressure PIV to be introduced in 2018; world's first implementation of reconstructing pressure field with Tomographic PIV

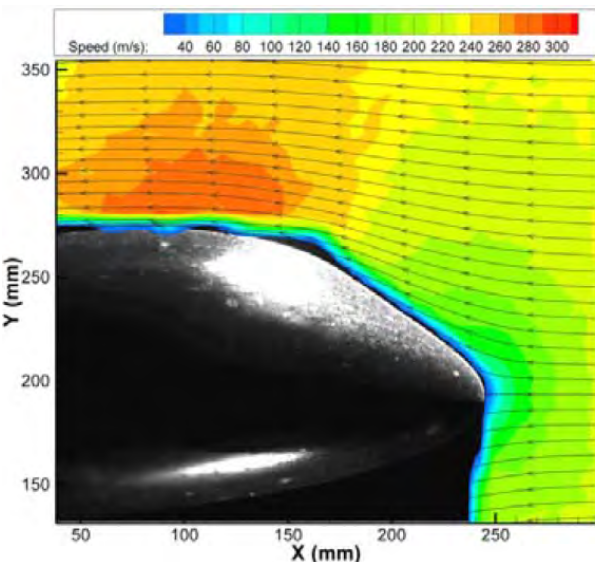
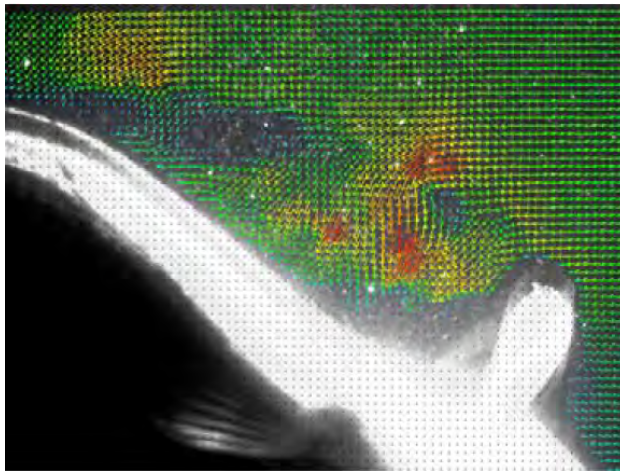
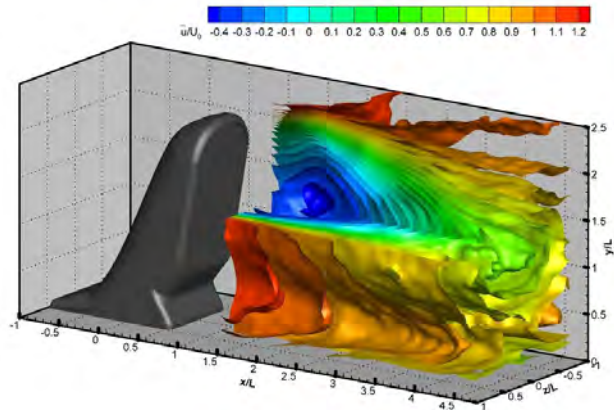
The MicroVec PIV systems use components from the world leading manufacturers. Double pulse, double cavity PIV lasers are sourced from Litron Lasers (UK), Quantel (France), Photonics Industries (USA) and Beamtech Optronics (China). Low end continuous DPSS lasers are sourced directly and offered with Microvec brand. High-speed CMOS cameras come from Ametek (USA) or Photron (Japan). On the low end, CMOS cameras come from Fastec Imaging (USA) and Mikrotron (Germany). High-resolution CCD cameras with double frame mode (also known as PIV mode) are sourced from Imperx (USA) and Vieworks (Korea). Microscopes for Micro PIV systems come from Nikon (Japan) or Leica (Germany).

MicroVec also manufactures proprietary synchronizer with unprecedented 250 ps jitter. It was the most accurate synchronizing device at the time of introduction to the market few years ago. In addition, many accessories and custom lenses are manufactured by Microvec.



Easily upgradable PIV systems without additional fee for software upgrades

User-friendly software: Easy synchronization & control of hardware



One of the main advantages of Microvec is its scalability. None of the systems is rigidly limited to a single purpose, instead they can be expanded to a higher level of complexity. For instance, 2D PIV systems are easily upgradeable to 3D PIV systems and 3D PIV are easily upgraded to Tomographic PIV.

Microvec software is sold with a perpetual license and all software the upgrades are offered free of charge to the customers.

Selected Features

- **MicroCap** software for image capture:
 - Integrated and easy control of all components (phase lock control): synchronizer, up to 8 cameras, laser
 - Camera control: free run, trigger, external trigger, PIV
 - Support image types: B/W, Grey 8-16 bit, RGB and digitizing function to image file formats: TIFF, BMP, JPG and AVI
 - Image store: long time capture, store to RAM or HD controlled by software
 - Frame grabber interface: PCI, PCI-E x1/x8
- **MicroVec** software for image-processing and analysis:
 - High resolution 2D PIV & PTV with multi-pass multi-grid window deformation algorithm
 - Mask function for removal of invalid image or data, multi-average function (particle image and vector result)
 - Calculating and plotting data results: U, V, W components of mean and fluctuating velocity, vorticity, RMS, turbulent kinetic energy values etc.
 - Batch processing: single directory or multi-directory
 - Support high density PTV function
 - Advanced vector filtering and correction
 - Export various image and video file formats
 - Export data file and links to MatLab, Tecplot and Origin for analysis and visualization
 - Includes GPU parallel processing support improving computing acceleration by factor 10

Additional Software Modules

- Planar Laser-Induced Fluorescence (PLIF) module for fluorescent image capture, analysis and display
- Particle Size Measurement software module for size/diameter/velocity analysis for multiphase flows.
- Pressure measurement with PIV module

Optional Software Modules

- Proper Orthogonal Decomposition (POD) module
- Dynamic Mode Decomposition (DMD) module
- Pressure measurement with PIV module
- Single Pixel Ensemble Correlation (SPEC) module



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