

**Tender Notification for the Procurement of a**  
**“Stereoscopic Particle Image Velocimetry (PIV) system”**  
**(Last Date for Submission: 6<sup>th</sup> March 2017)**

Kindly send your best quotation for a “Stereoscopic Particle Image Velocimetry (PIV) system” with the technical specifications given below on C.I.P. Bangalore basis. Your quotation should clearly indicate the terms of delivery, delivery schedule, and payment terms. The tenderer should submit Technical and Financial Bid separately in sealed envelopes superscribing the envelope as ‘Technical Bid’ and ‘Financial Bid’. Both these envelopes should again be put in a single envelope superscribed ‘TENDER FOR: Stereo Particle Image Velocimetry (PIV) System’ and should reach the Chairman, Interdisciplinary Center for Energy Research (ICER), Attn: NCCRD, Prof. R.N. Govardhan, Indian Institute of Science, Bengaluru 560 012 before 6<sup>th</sup> March 2017 by 4.30 pm.

**A clear compliance statement giving brochures and other details as necessary to show compliance with technical specifications given below is required along with the technical bid.**

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**Technical Specifications for the**  
**“Stereo Particle Image Velocimetry (PIV) System”**

**Required specifications:**

- 1) Dual pulsed Nd-Yag laser at 532 nm with 200 mJ/pulse (for each head) at 15 Hz repetition rate including required cables, alignment tools and at least three safety goggles.
- 2) Fourth harmonic crystal and mounting kit for the above Laser for generation of 266 nm for use with Acetone PLIF.
- 3) Two PIV cameras with minimum of 4 Megapixel resolution at 30 fps and capable of inter-frame times of better than 300 nano-seconds.

- 4) One External Image Intensifier compatible with the above PIV camera for image intensification along with gate times of 100 ns or lesser for use with Acetone PLIF.
- 5) Image acquisition hardware and cables to acquire images from camera in to computer.
- 6) Optics for both cameras for Stereo PIV for simultaneous viewing of test area. This should include lenses with 105 mm, f2.8 and 60 mm, f1.8 (or better) fixed focal length lens with appropriate mounts for each camera.
- 7) Sheet optics compatible with both 532nm and 266nm with minimum sheet thickness of 1 mm which can be adjustable to occur at a distance of 50 cm to 2 m. The required sheet width is 150 mm at 70 cm.
- 8) Light arm for 1.5m length having 3 right angle turns along with aperture and mounting for sheet optics as specified above.
- 9) High intensity diffuser attachment for laser to diffuse laser light for use as bright uniform background light in Shadowgraphy
- 10) Scheimpflug mounts for stereo PIV along with rail mount for mounting the cameras.
- 11) Calibration kit for Stereo PIV
- 12) Two heavy duty tripods for cameras capable of holding at least 8 kg each.
- 13) Optical narrow band filter for transmission of 532 nm (Two numbers) for PIV
- 14) Synchronization hardware unit with software control for synchronizing laser with camera including necessary cables.
- 15) High performance PC (2- Nos)
  - (a) for image acquisition along with the necessary hardware.
  - (b) for rapid processing of the PIV images.
- 16) Software platform for Stereo Particle-Image Velocimetry (2- licenses: one for each of the two PCs) with following functionalities:
  - (a) Camera plug-in and acquisition for two-cameras
  - (b) Synchronizing software for laser and camera with control of Image intensifier.
  - (c) 2D PIV cross and Adaptive-correlation based software with good sub-pixel accuracy
  - (d) Vector processing and display library including vorticity calculation and streamlines calculation
  - (e) 3D Stereo PIV software
  - (f) Ability to handle multiphase flows including simultaneous measurement of PIV and particle/drops
  - (g) Ability to export velocity fields and other calculated data into standard plotting programs
  - (h) Acetone PLIF processing tools
  - (i) Documented sufficiently good performance in the PIV challenge test

- 17) One year of comprehensive warranty and support including updates for all software.
- 18) List of previous installations in major Indian Academic/Research Institutions with testimonials to show established expertise in the area with supporting technical publications in the area.
- 19) Proof of adequate Indian technical infrastructure and service support in India for maintenance of above system.
- 20) For the Laser supplied with the system, explicit statement is required in the Technical bid that International Warranty will be transferred to the Local Indian agent of the OEM of the Laser. This requirement is additional to the requirement given in 19 above.

**Optionals:**

- 1) Three years of additional warranty and support for all components of the system.
- 2) High capacity PIV oil based seeder for use in high speed gas flows.
- 3) Acetone seeder unit for Acetone-PLIF

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**All communications in this regard should be addressed to:**

The Chairman  
ICER,  
Attn: NCCRD, Prof. R.N. Govardhan  
Indian Institute of Science  
Bangalore 560 012  
India

E-mail communications should be sent to:

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[raghu@mecheng.iisc.ernet.in](mailto:raghu@mecheng.iisc.ernet.in).

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