

Third Winner

Applied Research

Project Title

A System for Precise Measurement of Fluid Flow at High Frequency (30 kHz) Using Hot Wire and Hot Film Anemometry

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Abstract

The project was undertaken, both at research and semi-industrial stages, with the aim of providing a suitable base for development of research sector at universities and research organizations in the field of fluid mechanics.

Using the developed measurement system, the instantaneous velocity of fluid flow can be measured to high accuracy and at a high rate of 30 kHz. Turbulent flows and various phenomena such as boundary layer, flow separation, wake region on bodies, flow near wall, vortices and shear stress can be studied experimentally using this measurement system.

The system consists of different hardware such as probes, hot wire and hot film sensors, probe traversing mechanism, precision measurement electronic circuitry, and calibration and control devices. The system also has comprehensive software with the ability of acquiring and processing experimental data.

The indigenization of the hot wire/hot film anemometry is an important step towards the availability of this important technology at a reasonable and affordable cost, for researchers at universities, research organizations and industrial units, to do quantitative and qualitative research on turbulent flows in fluid mechanics, turbo machinery, aerospace, etc. The technology may also be adopted for manufacturing various flow meters and the spirometers for medical applications.