

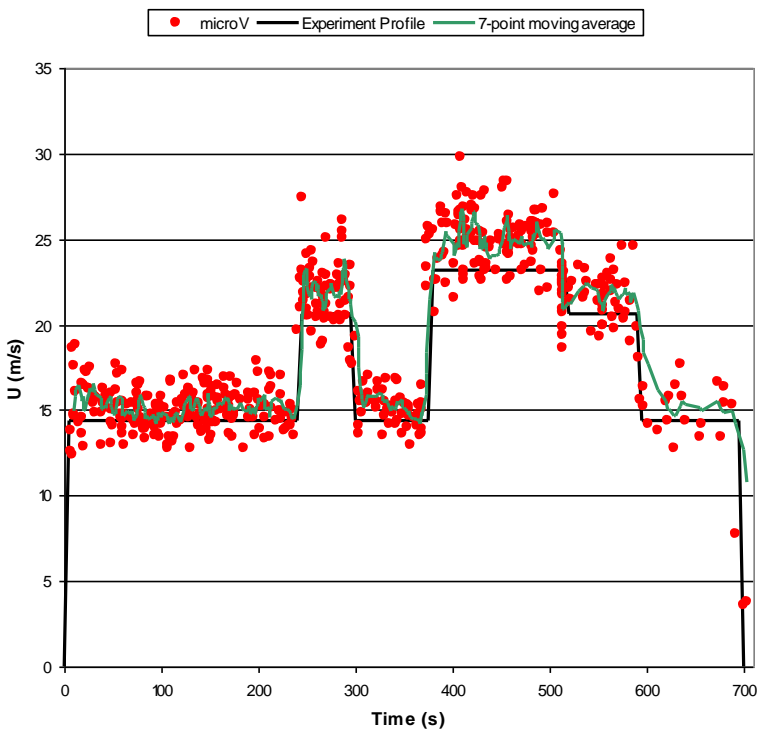
# microV<sup>TM</sup>

## A Unique Time-of-Flight Micro-Optical Velocimeter

The microV is a unique sensor in that it performs true velocity measurements in spaces where other sensors such as LDV probes simply cannot fit. The microV probe is extremely compact at 0.35" (9 mm) diameter and 1" (25.4 mm) long\*, weighs only 25 grams, and performs point measurements 0.29" (7.4 mm) from its face. This package contains all the sensitive optics in a single assembly – there is no alignment or calibration required on the part of the user – and no moving parts. With such a small sensor, the user is left with the freedom of immersing it directly in the flow or integrating it into the test model, facility, or vehicle.

The microV is based on technology developed at the California Institute of Technology and NASA's Jet Propulsion Laboratories. Today there are customers around the world in academic, industrial, and research settings enjoying the reliability and ease of use of MSE's microV.

\*This is the "short" version. The "long" version is 2.95" (75 mm) long.



Above: measurements performed in the open seas with a microV mounted in an unmanned underwater vehicle. The measurements (shown in red) are compared to the control input (black line) sent to the vehicle. The scatter in the data is due in part to the relatively thick boundary layer at the location of the sensor.

## The microV System

The microV System consists of a transceiver probe, driver electronics, and *BP-microV Burst Processor* acquisition hardware and software. Optionally, the system can be ordered with a computer with the hardware and software installed and tested by MSE technicians.

The microV System is a standalone system – no other lasers or optics are required. Simply place the electronics at a convenient distance to the acquisition computer and place your probe at the desired location. A 15-foot (4.5 m) cable is standard (longer lengths are optional). The Burst Processor software collects data, moves the probe on the optional electronic traverse, and presents flow statistics.

The process of measuring a profile is fully automated. The user simply dictates how many points per station to take, and the software does the rest. Such automation makes boundary layer characterization a breeze.



\*17" LCD monitor for scale



MEASUREMENT  
SCIENCE  
ENTERPRISE, INC.

123 W. Bellevue Dr., Suite 1  
Pasadena, CA 91105  
USA

Info@MeasurementSci.com  
Phone: +1 (626) 577 0566  
Fax: +1 (626) 577 0565

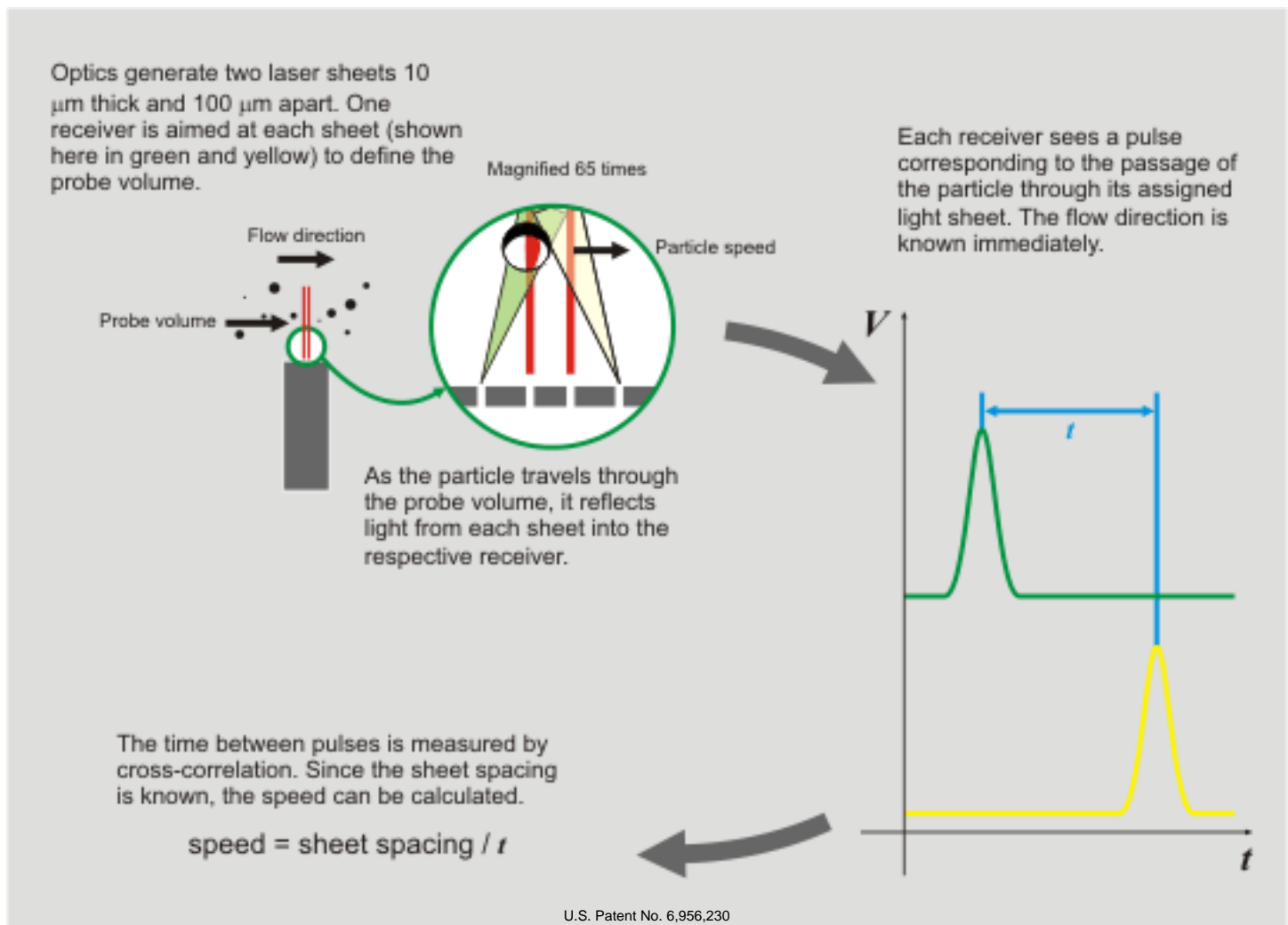
# microV™

## A Unique Time-of-Flight Micro-Optical Velocimeter

### The microV Concept

The microV is a time-of-flight sensor. It can be thought of as two optical “tripwires” placed a very precise distance apart connected to a very precise clock. When a particle crosses the first tripwire, the “stopwatch” starts, and when it crosses the second, the time is read from the clock. Since the distance between the two tripwires is well known, the speed can be calculated.

MSE’s core technologies have made it possible to design optics that project two microscopic light sheets microns apart and house independent receivers for each sheet in a very small package. The time difference between the crossings is measured by cross-correlation, and since there are two independent channels, the direction of the flow is known with absolute certainty.



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USA

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