

# Infrared Based Visualization of Wall Shear Stress Distributions with a High Temporal and Spatial Resolution

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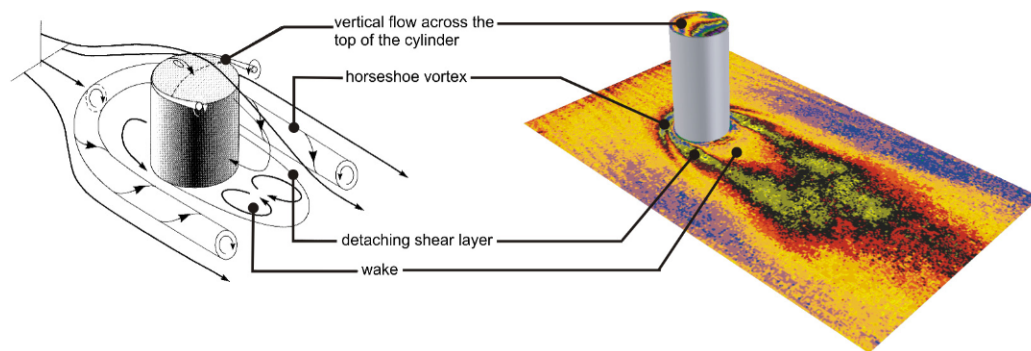


Fig. 1. Characteristic phenomena for the flow around a wall mounted cylinder (left) and temperature difference image from an infrared movie for a Reynolds-Number of  $Re_D = 40000$  (right).

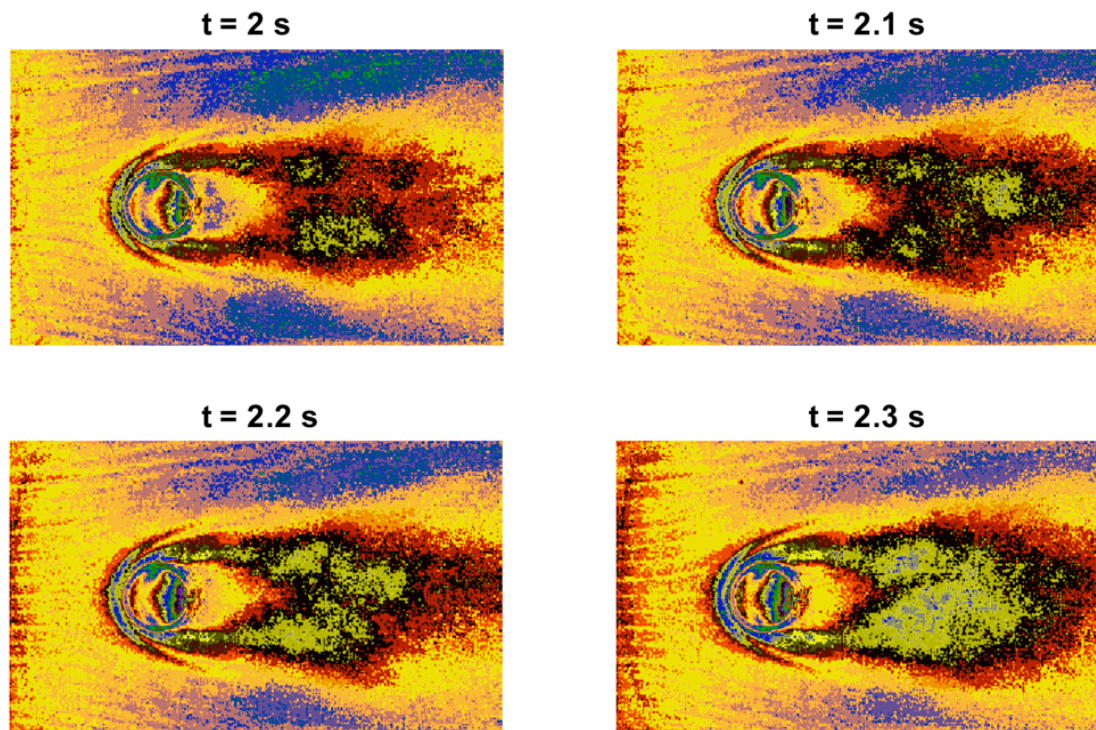


Fig. 2. Sequence of temperature difference images as a qualitative representation of the wall shear stress distribution for four different points in time.

These images are the result of a new infrared based measurement technique which allows the visualization of wall shear stress distributions with a high spatial and temporal resolution\*. The experiments were conducted for the flow around a wall mounted cylinder with a height to diameter ratio of  $H/D = 2$  for a Reynolds-Number of  $Re_D = 40000$ . The technique is not only able to capture the characteristic flow features displayed in figure 1, but can also visualize the unsteady processes in the wake of the cylinder with a good temporal resolution (Fig. 2)\*\*.

**References** : \*M. Reyer, I. Rudolph and W. Nitsche, Investigations into the Visualization and Quantification of Wall Shear Stress Distributions Using Infrared Thermography, AIAA-Paper 2006-3840, 25<sup>th</sup> AIAA Aerodynamic Measurement Technology Conference.

\*\*I. Rudolph, M. Reyer and W. Nitsche, Visualization of Time-Dependent Wall Shear Stress Distributions Using Infrared Thermography, ISFV12-30.3, 12<sup>th</sup> International Symposium on Flow Visualization.