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Simultaneous velocity and temperature measurements in turbulent flows using laser-cantilver anemometry and a thermocouple sensor MICHAEL HÖLLING, FLORIAN HEIDEMANN, MARINO BEENHAKKER, STEPHAN BARTH, ACHIM KITTEL, JOACHIM PEINKE, University of Oldenburg, Institute of Physics — We present a setup that combines our newly developed laser-cantilever anemometer (LCA) and temperature sensor. These sensors allow for high temporal and spatial resolution measurements. The LCA measures flow velocity by optically detecting the deflection of a tiny cantilever. A coaxial thermocouple of gold and platinum with a diameter of around 1 micrometer gives information about the temperature. The goal of the work is to measure fluid temperature and velocity in 'one spacial point' by positioning the sensor tips as close to one another as possible. Due to the different measurement principles of both sensors we do not expect any significant interference. In the analysis we focus on correlations between temperature fluctuations and velocity fluctuations, which is of current interest in local isotropic turbulence research.

Michael Hölling
University of Oldenburg, Institute of Physics

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