

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Two-dimensional Laser-Cantilever-Anemometer with re-designed cantilever chip - measurements and characterization MICHAEL HOELLING, JAROSLAW PUCZYLOWSKI, JOACHIM PEINKE, ForWind, Institute of Physics - University of Oldenburg — We present measurements performed with the two-dimensional Laser-Cantilever-Anemometer (2D-LCA) equipped with a re-designed cantilever chip. The 2D-LCA measures flow velocities by detecting the deflection of a tiny cantilever (about 140 x 40 micrometer) brought into the flow by means of the laser pointer principle. Latest investigations show a combination of both twisting and bending behavior of the cantilever for inclined angles of attack. Measurements for different combinations of angles of attack and velocities result in an unambiguous two-dimensional calibration which allows the 2D-LCA for simultaneous measurements of these two quantities, and of the longitudinal and transversal velocity component respectively. The new cantilever chip has a vertical structure added at the tip of the cantilever in order to increase the sensitivity to flows from angles of attack different than zero degrees. We present measurements taken with the new cantilever chip in turbulent laboratory flows in comparison to the old cantilever design and to x-wire anemometry data.

Michael Hoelling
ForWind, Institute of Physics - University of Oldenburg

Date submitted: 19 Jul 2010

Electronic form version 1.4