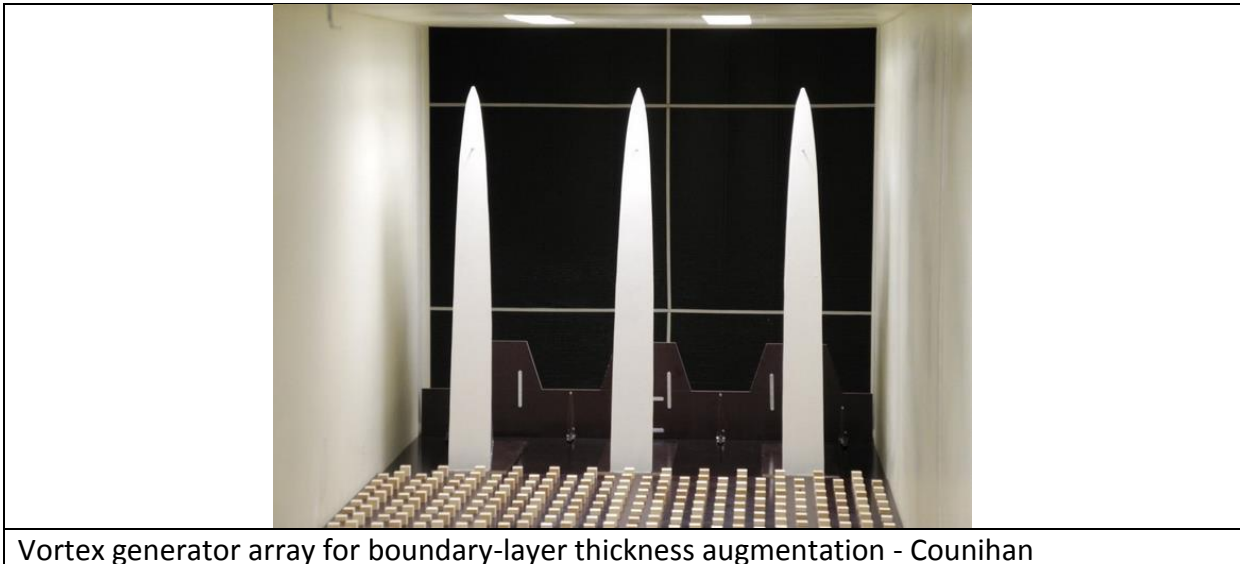


CZ.1.05/1.1.00/02.0060: Measurement and control of the wind tunnel boundary layer with turbulence generators

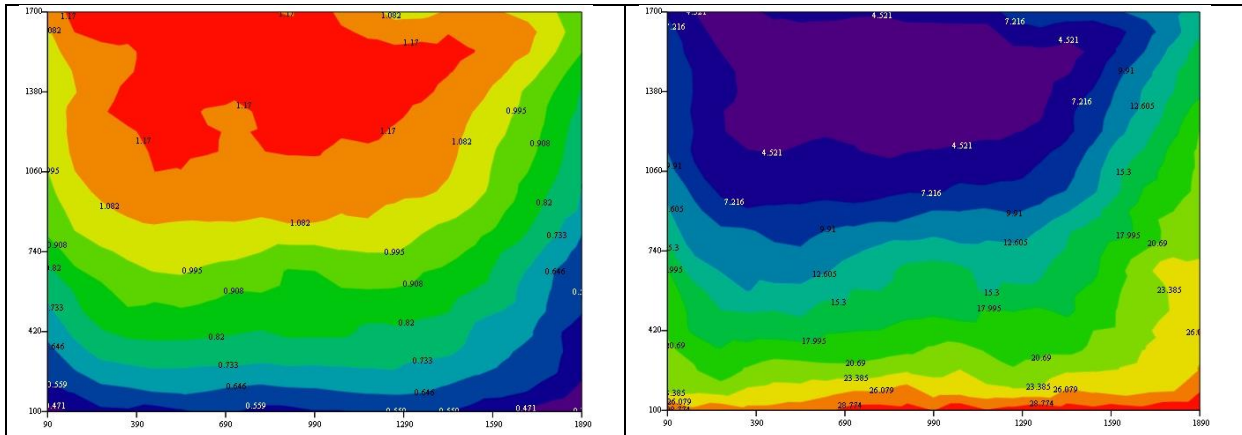
Investigators: prof. Ing. S. Kuznetsov, Dr.Sc., Ing. M. Plut

Since the bad quality of the flow in a wind tunnel can adversely affect test results, accurate and consistent flow measurements are required, along with an understanding of the sources, characteristics, and control of the flow turbulence. This research focuses on the turbulence measurement and the determination and assessment of air flow quality.

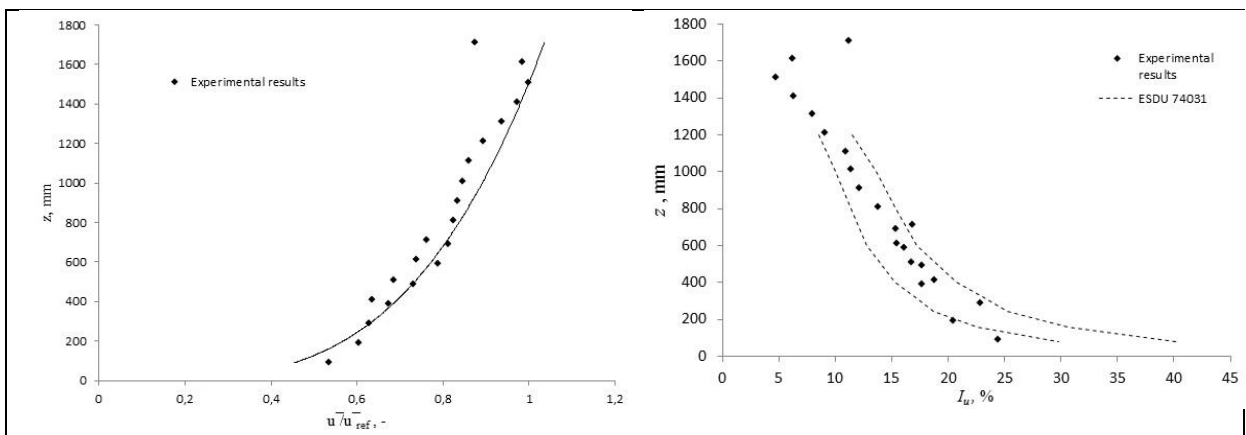
The description of turbulent boundary layer and simulation of the natural atmospheric boundary layer (ABL) is based primarily on similarity arguments. Using this approach, the statistical flow parameters are described in terms of empirical functions requiring a number of parameters, which rules the flow in different parts of the boundary layer. Specific empirical relations have been derived from experimental data, by organizing the data in accordance with the established turbulent boundary-layer model.



The research and the results discuss some experimental variations in the ABL under the non-uniform surface conditions. In addition, basic requirements for the wind-tunnel simulation of the ABL flow are emphasised. The principles and practical application of instrumentation used in the measurement and characterization of wind tunnel turbulence are described.



The mean relative velocity and turbulence intensity distribution in cross-section of the wind tunnel



Profiles of mean velocity and turbulence intensity quantities under stable conditions