MICROMETEOROLOGICAL RESEARCH AT THE DEPARTMENT OF GEOPHYSICS, UNIVERSITY OF ZAGREB – PART I

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Micrometeorological studies are necessary for a complete understanding of the physical processes in the atmospheric boundary layer (ABL) as they complete information about the turbulent exchange of momentum, energy and matter between the ground (solid or liquid surfaces) and the lower troposphere. Without this information, it is impossible to qualitatively close partial differential equations that are built into mathematical models for numerical weather prediction. At the same time, micrometeorological measurements still represent a challenge in atmospheric sciences. The reason for this is primarily in the demanding characteristics of the instruments, e.g., high sampling frequency of meteorological variables, and nontrivial performance of the measurements themselves (e.g., the data from different locations and different heights above the surface need to be synchronized).

Nevertheless, since the beginning of this century, the Department of Geophysics at the University of Zagreb (DGUZ) invests continuous effort and resources into micro-meteorological research and already for ten years perfects itself in that direction. The main motive for entering this area was investigation of the bora turbulence about which, until then, was very little known. For this purpose, DGUZ performed micrometeorological *is situ*, single point measurements of bora wind using 3D ultrasonic anemometers in the town of Senj (2004–2006), on Vratnik Pass (2004–2005) and on the Pometeno brdo in the hinterland of the city of Split (2010–2011; in cooperation with the Croatian Meteorological and Hydrological Service). The interest expands in the purpose of air pollution studies, so in 2009 DGUZ carried out micrometeorological research in the town of Kutina, ~ 60 km west of Zagreb. Meanwhile, the need for spatial investigation of bora related turbulence emerged. In this purpose the analysis of NCAR Electra aircraft turbulence dataset produced during the Meso-scale Alpine Program (1999) was performed in 2012.