



**Geophysical Institute**, Department of Geophysics

Faculty of Science, University of Zagreb

Horvatovac 95, Zagreb, Croatia

Tel. (+385 1) 460-5900, fax: (+385 1) 4680-331

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## **NOTIFICATION**

As a part of the seminar and colloquium program at the Geophysical Institute on **23<sup>rd</sup> of February 2012 at 14:15** the following lecture will be held:

**Prof. Stephan F. J. De Wekker**

(Department of Environmental Sciences, University of Virginia, Virginia,  
SAD):

### **Investigation of multi-scale flows and boundary layer structure in complex terrain using airborne Doppler lidar**

**ABSTRACT:** The spatial structure of valley flows is poorly understood with flow structure affected by factors such as the presence of ambient synoptic-scale winds, tributary valleys, and adjacent oceans. In this presentation, I use three-dimensional winds obtained with an airborne Doppler lidar to investigate the spatial structure of the topographically driven flows and the associated boundary layer structure in complex coastal terrain in southern California. The airborne Doppler lidar reveal a detailed spatial structure of the atmospheric flows within the valley and their associated aerosol features. Clear skies prevailed on the flight day with weak synoptic northwesterly flows. The data document a shallow sea breeze transitioning into an upvalley flow in the Salinas Valley that accelerates in the upvalley direction. Along with the acceleration of the upvalley wind, enhanced sinking motions are observed. No return flows associated with the sea-breeze or upvalley flows are observed but a distinct wind minimum is present at heights around 400 m MSL near the coast and 600 m MSL up the valley. While synoptic flows are aligned along the valley axis in the upvalley direction, a northerly cross-valley component is observed at ridge height. This flow intrudes into the valley atmosphere and induces, along with thermally-driven slope flows on the sunlit valley sidewall, a cross-valley circulation that causes an asymmetric distribution of the aerosols. I will also present some preliminary results from mesoscale model simulations which were conducted to evaluate the performance of the mesoscale model and to investigate the processes responsible for the observed spatial flow structure.

Students and all interested parties are invited to attend the lecture that will be held in the room No. 2 at the Geophysical Institute, Horvatovac 95, Zagreb.