



## Geofizički odsjek

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## O B A V I J E S T

Dana **7.1.2015. u 13<sup>15</sup>** sati će se održati u okviru seminara i kolokvija na Geofizičkom odsjeku PMF-a sljedeće izlaganje:

**Dr. sc. Chiel van Heerwaarden**

*(Max Planck Institute for Meteorology, Hamburg, Germany):*

**A comparison of heterogeneously heated convective boundary layers  
with fixed flux and fixed temperature boundary conditions**

**ABSTRACT:** We have studied the heterogeneously heated Convective Boundary Layer (CBL) with the aim to create a parameterization for land-surface heterogeneity. This system has been investigated by means of dimensional analysis and results from Large-Eddy Simulations (LES) and Direct Numerical Simulations (DNS). We present results from two different experiments: a CBL that is heated from patches with a fixed surface heat flux, and a CBL that is heated from stripes with a fixed surface temperature. The first experiment represents for instance an urban heat island, whereas the second is applicable to flow over arctic leads.

For the first experiment, we show that each simulation contains first the formation of a peak in kinetic energy, corresponding to the “optimal” heterogeneity size with strong secondary circulations, and subsequently the transition into a horizontally homogeneous CBL. We have developed scaling laws that show that the optimal state and transition do not occur at a fixed ratio of the heterogeneity size to the CBL thickness, but instead occur at a higher ratio for simulations with increasing heterogeneity sizes.

For the second experiment, we show that imposing a fixed surface temperature directs the system towards a steady state where the release of heat from the warm stripes equals the amount of heat taken up from the cold stripes. In this development, the system travels back and forth between different states and exhibits oscillations in the kinetic energy.

Pozivaju se studenti, apsolventi i svi zainteresirani da prisustvuju predavanju, koje će se održati u predavaoni br. 2 Geofizičkog odsjeka PMF-a, Horvatovac 95, Zagreb. Studentima 2. godine diplomskog sveučilišnog studija fizika - geofizika je prisustvovanje predavanjima u sklopu Geofizičkog seminara obavezno.