Geophysical Research Abstracts, Vol. 7, 10103, 2005
SRef-ID: 1607-7962/gra/EGU05-A-10103

Observations and Simulations of Katabatic Flows during a Heatwave in Iceland

H. Ágústsson (1,2,3), J. Cuxart (4), A. Mira (4), H. Ólafsson (1,2,3)

(1) University of Iceland, Reykjavík, Iceland, (2) Icelandic Meteorological Office, Reykjavík, Iceland, (3) Institute for Meteorological Research, Reykjavík, Iceland, (4) Universitat de les Illes Balearic, Palma, Spain, halfdana@hi.is

Katabatic flows during the night 11–12 August 2004 in Iceland are studied using observations and numerical weather prediction models. During this period, there was a strong heatwave in Iceland and the temperature in Reykjavík reached 24.8°C on 11 August which is a local record. In relation with these very high daytime temperatures, weak synoptic winds and clear skies, a radiative surface cooling in excess of 10-15°C was observed during the night at many locations throughout Iceland. The situation has been simulated with the Meso-NH model. The results indicate that katabatic winds develop in the stable nocturnal boundary layer when the cold and heavy air descends from the Icelandic highlands and mountains down to lower lying areas. The simulations are made at a high horizontal and vertical resolution, forced with boundaries and initial conditions from the ECMWF. The simulations and initial conditions are compared to available ground based observations and satellite images showing the surface radiative temperature. The simulations seem to reproduce well most of the observed winds, including patterns where weak synoptic winds or katabatic flow interact with orography. The simulations also give valuable indications of locations of relatively strong katabatic winds, where no observations are currently available. However, careful verification is still under process. A similar simulation is planned with the MM5 and an intercomparison will be performed.