Geophysical Research Abstracts,
Vol. 11, EGU2009-8087, 2009
EGU General Assembly 2009

Katabatic flows and their modification by the shape of terrain

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Katabatic flows are meteorological features in the boundary layer. They form in hilly regions under calm, cloudless atmospheric conditions by radiative cooling of the surface. Their occurrence is determined by the cooling rate, the vertical temperature gradient as well as the elevation angle. The poster show a study of idealized katabatic flows influenced by different shapes of terrain. The analysis is embedded in an investigation of the functionality of a tropical mountain rain forest region in southern Ecuador funded by the DFG. Within the research unit 816 precipitation measurements with a vertical rain radar profiler reveal constant early morning rainfall events, which have been traced back to a formation of a Mesoscale Convective System in the Peruvian Amazon basin. The generation of the MCS is assumed by a confluence of cold drainage air from the Andean slopes and valleys into the Amazon due to the concave lined Andes in this region. Inside the Amazon basin the cold air converges with the warm-moist air inducing deep convection. The numerical model ARPS has been implemented to analyze the hypothesized confluence of the katabatic flows. Fife simplified terrain models representing the main features of the Andes in the investigation area have been used. With regard to the confluence of the cold drainage air modifications due to the shape of the terrain will be discussed.