



An application of the hydraulic katabatic wind model to the slope flows in mid-latitudes

D. Martínez, J. Cuxart and M. A. Jiménez

Universitat de les Illes Balears, Spain (dani.martinez@uib.es)

The hydraulic model approach to the katabatic flows can be a useful tool for the parametrization of the subgrid-scale transports in climate and NWP models. In this approach, the katabatic flow features are reduced to vertical bulk quantities related through a well defined set of equations.

Two high-resolution mesoscale simulations are used to check the goodness of the bulk approach to the katabatic winds. These simulations have been performed with large detail within the lower 1000 meters above the ground in two different sites in the middle latitudes: the Duero basin in the northern Spanish plateau and the isle of Mallorca in the western Mediterranean sea.

The hydraulic model is applied to the simulated katabatic flows using the framework set out in Mahrt (1982), Renfrew (2004) and Haiden and Whiteman (2005). Besides, the momentum and heat budget equations are used to study the relevancy of each forcing term and the evolution of the katabatic-layer bulk quantities along the slope and over the time.