Geophysical Research Abstracts,
Vol. 11, EGU2009-8662, 2009
EGU General Assembly 2009

Nocturnal low-level jets: sporadic turbulence on complex terrain

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Under weak pressure gradient conditions and clear-sky nights the development of locally generated circulations is favourished, specially in complex terrain. As night advances, the layer close to the ground cools down and stably stratified conditions prevail, with weak and usually sporadic or intermittent turbulence. In this work this phenomena is studied through high-resolution mesoscale simulations that are verified with data from weather stations and satellite information. The chosen domain is the island of Majorca, located in the western Mediterranean sea. A large variety of circulations is observed in the three main basins of the island, with drainage flows and organization at the basin scale. These low-level jet structures occasionaly cause turbulent bursts and very efficient mixing in the vertical, leading to significant changes of the atmospheric conditions close to the ground.