



Use of a boundary-layer profiler for aviation meteorology

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During recent months, a LAP3000/RASS profiler has been set at Madrid-Barajas airport. This device provides information about the vertical profiles of the horizontal and vertical components of the wind velocity and the virtual temperature up to a height of 3000 m above ground level for wind and 1500 m for temperature. The vertical resolution is 100 m and the temporal resolution 10 minutes. The analysis of the profiles allows improving the knowledge on the main climatological characteristics of the atmospheric boundary layer over the airport. The profiler also provides the forecaster with information about the low-level phenomenology that can constitute an important help in the short-term prediction. It is especially relevant the information from the nocturnal stable boundary layer, when a set of phenomena that can eventually have impact on the airport operations are frequently observed. Among them, strong thermal inversions, vertical wind shear -sometimes associated to low-level jets- or drainage winds may be stood out. It is especially relevant the role of drainage winds that flow from different directions and converge over the airport, so originating upward motions that usually inhibit fog formation through the vertical dispersion of moisture and the horizontal advection of relatively dry air. Finally, data gathered by the profiler are used in the initialisation of a single-column model that is operationally run for the airport four times daily for short-term fog and low-clouds forecasting.