



Weather monitoring around airports with Scanning Doppler lidars

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For the places, like airports, the weather impact can be strong on human activities and life. This is why the meteorological observations are crucial in order to understand and monitor the met situations sufficiently fastly and precisely. The goals are to warn in advance the air traffic controllers of the arrivals of possible atmospheric hazards. One of the key aspects is then to follow the weather around the airports over a wide area but with a high spatial and temporal resolution at the same. Another point is the necessity to improve the weather forecast in order to anticipate the influence of the weather on the air traffic management.

From the common wind profiling to the wind shears and wake vortices monitoring through the weather overview, wind Doppler lidars are at the cornerstone of all these requirements in complement to usual sensors like radars or sodars. As vertical wind profiler, Doppler lidars provide accurate wind information inside the planetary boundary layer and especially the Ekman layer with a high resolution from 20 to 50m. This information can be very helpful for improving the numerical weather forecast through their assimilation. When they are scanning, Doppler lidars are able to perform a full monitoring of the wind of the volume of the atmosphere around the airports. These advanced 2D to 3D wind fields are very useful for proving cross winds measurement along the glide paths or for observing any type of wind shears.

This study will present some results obtained with the Windcube200S developed by Leosphere during two experiments performed at Charles-de-Gaulle airport. These results have been obtained in the framework of the SESAR Eu 12.2.2 project relative to the wake vortex monitoring during two campaigns. Some other results obtained in specific situations of wind shears will also be described. These results will show how Doppler lidars can be helpful for the meteorologists and the controllers to better understand, anticipate and forecast wind hazards.