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High resolution numerical modeling over the Nice Côte d'Azur International airport

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The Nice Côte d'Azur International Airport, located South-East of France by the edge of the Mediterranean sea, is affected by various low level wind shear phenomena for which detection and prediction are particularly relevant for aircraft security. Currently, the wind profiler available on the airport platform in order to identify those phenomena cannot detect horizontal wind shears that take place on the runaways. A numerical study is undertaken to evaluate the capability of high resolution numerical modeling to predict wind shear phenomena in the boundary layer taking place at Nice Côte d'Azur International airport. The French research mesoscale numerical model Meso-NH (Lafore et al., 1998) is used to address this issue. The model horizontal resolution is set to 500 m which is five times higher than the current operational capabilities at Météo-France with the AROME model (available since December 2008 at 2.5 km resolution). A number of wind shear situations have been selected in Spring 2009 for which Meso-NH has been run starting from operational AROME analyses. The results of the simulations are compared to the Météo-France operational models (ARPEGE, ALADIN, AROME) and to observations available around the airport (surface wind stations, wind profiler, AMDAR, wind lidar from a dedicated field campaign). Preliminary conclusions are given on the relevance of high resolution numerical modeling for predicting low level wind shear phenomena and on the interest of high resolution data assimilation of wind profiler data.