MODIFICATION OF A MESO-SCALE MODEL FOR NOWCASTING PURPOSES : THE AROME-NOWCASTING AND AROME-AIRPORT PROJECTS.

Ludovic Auger[2], Susanna Hagelin[2], Pascal Brovelli[1], Olivier Dupont[1], Pierre Brousseau[2]

1 Météo-France – Forecast Department – Nowcasting Department
42, av. Gaspard Coriolis 31057 Toulouse France
2 Météo-France – CNRM – Modeling and Assimilation Department
42, av. Gaspard Coriolis 31057 Toulouse France

ABSTRACT

We will present here two nowcasting-related projects currently under development at Meteo-France : AROME-nowcasting and AROME-airport, then scientific challenges and some problematic issues will be discussed.

The AROME-nowcasting project aims at providing relevant meteolorogical parameters for very short ranges (less than 6 hours) This project is based on the 2.5 km model AROME-FRANCE system (running every 6 hours), that will provide boundary and initial conditions to our model. The first issue was to adapt an assimilation system that was developed for meso-scale systems with a 3 hour cycle, for that we chose not to cycle our assimilation system and to start each hour from a new large scale guess file. The performance of the system, mainly due to the use of most recent observations will be presented.

The second part of the talk will be dedicated to the AROME-airport project. Its goal is to provide relevant weather forecast for very short ranges (less than 6 hours) around Charles de Gaulle airport near Paris. This model is based on the 2.5 km resolution AROME-nowcast system adapted to a more refined grid. In that project we mainly aim to forecast accurate TKE-related information in order to give data to a Wake-Vortex prediction model. AROME-ariport was evaluated during a first observation campaign during which specific wind profiles measurements were carried out. We were also interested into assessing the model behaviour as regards the turbulence parameters since Wake-Vortex models require wind and TKE parameters as inputs. An important issue is linked to the fact that AROME-airport has a 500m grid size since with this resolution the turbulent vorticies in the boundary layer are partly explicitly resolved, as a consequence specific settings must be used. Some appropriate diagnostics and comparisons of AROME-airport to wind measurements will also be shown, the difficulty to improve information from a large scale model will also be illustrated.