

AROME-NWC : an adaptation of the meso-scale NWP model AROME to nowcasting

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The increase in computing power makes it possible now to use meso-scale models with a higher refresh rate. In that context a nowcasting system (denoted by AROME-NWC) based on the operational non-hydrostatic model AROME [1] was developed in order to provide recently updated forecasts to nowcasting systems and forecasters.

First, the strengths and weaknesses of a meso-scale model as regards nowcasting will be discussed and it will be shown how such a model can be modified to cope with the challenges of nowcasting. Then the different choices in the design of AROME-NWC system will be presented. It is important for example to have a model that delivers its forecasts within 30 minutes due to the ranges that are of interest in nowcasting (0-6 hours). One important issue is the limited number of observations that can be used due to the necessary short cut-off time, consequently it was chosen not to cycle the system and to start from an AROME forecast each hour in order to benefit from a background that has seen a maximum number of observations.

The performance of this system has been assessed with a comparison to the operational AROME model through classical scores and cases study. A general increase is to be found linked to the use of more recent observations. Finally the last matter discussed will be about the necessary use of nowcasting diagnostics made from the AROME-NWC, as a matter of fact the important number of forecasts available due to the hourly refresh is of benefit to output products and automatic services for customers, those will help the forecasters with analyzing a large amount of data.

References

[1] Seity, Y. and Brousseau, P. and Malardel, S. and Hello, G. and Bénard, P. and Bouttier, F. and Lac, C. and Masson. " The AROME-France convective-scale operational model" *MWR*, vol. 139, pp. 976-991, 2011.