

## MESO-GAMMA 3D VAR ASSIMILATION ON SOME WET MAP EVENTS: IMPACT ON HIGH RESOLUTION SIMULATIONS

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**Abstract:** High resolution simulations performed to study MAP IOP events are currently initialized with operational large scale analyses or with the MAP ECMWF reanalyzes. However, previous studies had shown the impact of a meso-scale analysis (10 km resolution) on mesoscale convective systems simulations (Ducrocq et al. 2002, Nuret et al. 2005) Over mountainous regions, higher resolution may help to initialize some valley features, as the cold pool in the valleys (Jaubert et al 2005). The purpose of the presentation is to study thoroughly the impact of mesoscale data assimilation on MAP IOP high resolution simulations using a variational assimilation scheme. The tool used here was developed in order to perform the first tests of the assimilation part of the AROME (Applications of Research to Operations to Mesoscale) Meteo-France project, which aims at developing a new high-resolution NWP system. The non-hydrostatic model Meso-NH is used in a grid-nesting configuration with two nested models (10km and 2.5km grid resolution). Assimilation is performed with a hybrid assimilation system, i.e., innovation vector is computed from the Meso-NH forecast, whereas the minimization is performed with the 3D-VAR ALADIN system. The 3D-Var Analysis is running both at 10km and 2.5 km resolution. Using the MAP dataset, we explore the impact of the analysis resolution, as well as the impact of the assimilation duration and frequency, on the high resolution simulations results for some major IOPs of the MAP precipitation project, as the IOP2b, IOP08 and IOP15a events over the Lago Maggiore target area. The relative impact of the different kind of data is also discussed.

### Bibliography:

Ducrocq et al 2002: Storm-scale numerical rainfall prediction for five precipitating events over France: on the importance of the initial humidity field. *Wea. forecasting*, 17, 1236-1256.

Jaubert et al 2005: Numerical simulation of meso-gamma aspects of foehn at the ground level in the Rhine valley. Accepted in *QJRMS*

Nuret et al 2005: Mesoscale analysis an impact on simulation of the IOP14 of the MAP experiment. In revision for *QJRMS*