

# HOURLY MESO-SCALE SURFACE DATA ANALYSIS FOR NOWCASTING

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An hourly meso-scale analysis of near surface parameters (T2m, Hu2m, V10m) has been developed over France using the high density (spatial and temporal) surface observations. This analysis uses the optimal interpolation technique and has been tuned to represent meso-scale events for forecasters rather than for initializing a numerical model. The first guess is the more recent forecast available from the operational French meso-scale model (ALADIN), which is comprised between 4 and 9 hours range. The horizontal spatial resolution of the first guess and the analysis is 9 km. The density of the hourly surface observation network over France is 40 km in average. The quality control of observations consists in a comparison to the first guess and in a test of spatial consistency. The test tunings are not too severe in order to keep meso-scale features like for instance those associated with thunderstorms. Some specific controls are applied to avoid that mountainous or coastal observations degrade the analysis since the structure functions of forecast errors are supposed homogeneous and isotropic. Additional diagnostics, such as the convective available potential energy (CAPE) of the 2m air parcel, or the low-level convergence moisture (MOCON), are computed from the meso-scale analysis outputs.

The analysis has been first evaluated on several convective case studies. Then a real time experimentation has been conducted during summer 2001 where a large part of the Météo-France meso-scale surface observations have been concentrated on an hourly basis. In order to improve the analysis on the frontier regions, the available surface observations from the neighbouring countries have been also taken into account in the analysis. During the experimentation, the advice of 'forecasters' has been sought on the operational use of these meso-scale analyses. The analysed fields were available 40 mn after observation time on the forecaster's workstation. Several possible uses have been identified. The meso-scale analysis is interesting as an interpolator tool for observations and is able to represent some meso-scale features like wind gustiness or strong cooling under thunderstorms. The differences between the meso-scale analysis and the ALADIN forecast are useful to confirm or invalidate the forecast scenario. Finally the potential of the diagnostics computed from analyses for thunderstorm nowcasting is still under investigation.