Objective forecast verification of INCA-FVG outputs compared to WRF, ALARO and COSMO LAM.

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INCA is a nowcasting software developed by ZAMG (Austria) that merges extrapolated observations by stations and radar with model outputs, in order to overcome the LAM (Local Area Model) spin-up problem with a computationally faster system. This software is of particular interest for areas with high density of surface stations and possibly covered by meteorological radars, because the 3D-VAR or 4D-VAR assimilation of these kind of data (radar in particular) is still difficult and computationally expensive in modern LAMs.

OSMER - ARPA FVG runs INCA operationally (hereafter INCA-FVG) at 1 km of spatial resolution, fed by the numerous surface stations available in Friuli Venezia Giulia (NE Italy) and by the Fossalon di Grado doppler radar, using the ZAMG ALARO-5 LAM (at 4.8 km of spatial resolution) as background model.
OSMER asked CETEMPS (L'Aquila University) to run twice a day, or a period of about 75 days between 15/5/2011 and 31/7/2011, a hindcasting version of WRF-ARW (Advanced Research Weather Research and Forecasting) model at 3 km resolution, that assimilates (with 3D-VAR methodology) the same set of surface stations assimilated by INCA-FVG, plus some high resolution vertical soundings, on a domain larger than that of INCA-FVG. On the other way, the WRF simulations do not assimilate the radar SRI data, that are a very important contribute for the INCA-FVG forecasts within the very first hours.

In this work the results of an objective verification of the INCA-FVG, ALARO and WRF rain forecasts are presented, in addition to the Italian Air Force COSMO LAM, using different methodologies, varying from an object-oriented spatial verification to a nearest neighbour area verification and a pointwise station-based verification. Some preliminary results show that in the first 3 hours INCA-FVG performs better, while within short lead times (4 to 12 hours) there are alternate successes for the LAMs.