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Local Analysis and Prediction System (LAPS) Assimilation for meteorological fields downscaling: application in the frame of an off-line Air Pollution modelling system and evaluation with independent meteorological observations

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Since 2002 the Italian National Agency For New Technologies, Energy and the Environment, ENEA, has been leading the MINNI (National Integrated Modelling system for International Negotiation) Project, for the development of an Integrated Assessment Modelling system. MINNI consists of two main components: a multi pollutant eulerian Atmospheric Modelling System (AMS), and the RAINS-Italy Integrated Assessment Model. The atmospheric transfer matrices provide the link between the AMS and RAINS-Italy. The AMS includes emissions, meteorology and pollutants dispersion/chemistry modules. In its first version AMS was applied to estimate deposition and air concentration fields over Italy, with a spatial resolution of 20x20 km^2 and an hourly time step on the whole 1999 year.

An improved version of AMS with a spatial resolution of 4x4 km^2 has been recently implemented. The Local Analysis and Prediction System, LAPS, developed at the NOAA's Forecast Systems Laboratory, has been used to derive the meteorological fields at higher resolution. LAPS has been initialized by the 20x20 km^2 spatial resolution fields calculated by the Regional Atmospheric Modeling System, RAMS, and by surface observations. The LAPS fields and those derived by the SURFRO diagnos-

tic module (PBL scaling parameters, dry deposition velocities, horizontal and vertical turbulent diffusivity fields and natural sea-salt and soil emissions driven by the surface wind) feeds the Flexible Air quality Regional Model, FARM.

The LAPS meteorological fields have been compared with radiosoundings, surface observations and the first guess fields to verify the goodness of the selected methodology. The results of these comparisons are presented and discussed taking particular care to study the meteorological parameters more strictly connected with the pollutants dispersion.