

# INTEGRATION OF MEASUREMENT AND MODELLING SYSTEMS TO RECONSTRUCT POLLUTION IMPACTS AROUND THE INDUSTRIAL AREA OF PRIOLO (SICILY)

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The region north of Siracusa, southeast Sicily, is a site characterized by the presence of a large industrial area extending for more than 20 km along the Ionian coast. Here a large number of tall stacks routinely emit hot pollutant plumes, whose behaviour is affected by strongly complex flow regimes influenced by both the sea-land discontinuity and the internal topography. Scope of this study is to verify the integration of a modelling system with the local monitoring network, in order to get an overall view of the pollution levels on the entire area. To this aim, the 3D modelling system made by the mass-consistent diagnostic flow model MINERVE, the meteorological pre-processor SURFPRO and the Lagrangian particle dispersion model SPRAY3 has been used. They are potentially able to reproduce the strongly non-homogeneous and non-stationary flow and dispersion patterns of this complex site, making a direct use of the local ground-based and vertical profile meteorological measurements. Annual averages of SO<sub>2</sub> and NO<sub>x</sub> have been reconstructed weighting the impact of short term episodes chosen through a sampling technique based on the local weather regimes, preliminarily tested using the monitoring network data. Model results have been compared with measurements, showing a good capability to reconstruct both single episodes and the long-term averages and setting in evidence the synergic role of the models, able to extend the information given by a local network and allowing a better comprehension of the dispersion phenomena.