



## **MODIS Satellite-based particulate matter monitoring in Northern Italy: towards a MACC core-downstream processing chain test-case**

Walter Di Nicolantonio (1), Alessandra Cacciari (1), Alessandro Tiesi (1), and Claudio Tomasi (2)

(1) Carlo Gavazzi Space c/o ISAC-CNR, Earth Observation & Applications Dept, Bologna, Italy, (2) Institute of Atmospheric Science and Climate (ISAC), CNR, Bologna, Italy

Satellite remote sensing of both trace gas constituents and Particulate Matter (PM) can be profitably exploited in the Air Quality field by combining satellite observations with regional meteorological modelling and ground-based measurements. With regard to this, the capability of MODIS sensors (Terra and Aqua/NASA platforms) to retrieve aerosol optical properties has been used in a semi-empirical approach to estimate PM content at the ground over a domain containing whole Northern Italy. Daily maps of satellite-based PM<sub>2.5</sub> concentrations over Northern Italy have been derived. Daily estimates and monthly averaged values have been compared to in-situ PM<sub>2.5</sub> sampling providing a good agreement, with the MODIS-based concentrations tending to underestimate the values by at most 20%.

These findings represent the direct outcome of the prototype Satellite-based Particulate Matter demonstration service developed in strict synergy between QUITSAT project (2006-2009) - funded by the Italian Space Agency - and PROMOTE project (2006-2009) - supported by the European Space Agency. In both projects a significant role has been played by regional environmental agencies – ARPA - of 3 regions located in the Po valley area (Emilia Romagna, Piedmont and Lombardia) acting as Users and analyzing the quality of the achieved satellite-based products and service performances.

Relying on the experience achieved within these projects, ARPA users have expressed the interest in providing requirements, following the development, and testing the core-downstream-end user service chain in O-INTERFACE MACC subproject funded under the EU 7th Framework Program and the forthcoming EU 7th FP PASODOBLE project.