



Testing an advanced satellite technique for dust detection as a decision support system for the air quality assessment

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In order to correctly apply the European directive for air quality (2008/50/CE), local Authorities are often requested to discriminate the possible origin (natural/anthropic) of anomalous concentration of pollutants in the air (art.20 Directive 2008/50/CE). In this framework, it's been focused on PM₁₀ and PM_{2,5} concentrations and sources. In fact, depending on their origin, appropriate counter-measures can be taken devoted to prevent their production (e.g. by traffic restriction) or simply to reduce their impact on citizen health (e.g. information campaigns). In this context suitable satellite techniques can be used in order to identify natural sources (particularly Saharan dust, but also volcanic ash or forest fire smoke) that can be responsible of over-threshold concentration of PM_{10/2,5} in populated areas. In the framework of the NIBS (Networking and Internationalization of Basilicata Space Technologies) project, funded by the Basilicata Region within the ERDF 2007-2013 program, the School of Engineering of University of Basilicata, the Institute of Methodologies for Environmental Analysis of National Research Council (IMAA-CNR) and the Regional Agency for the Protection of the Environment of Basilicata Region (ARPAB) have started a collaboration devoted to assess the potential of the use of advanced satellite techniques for Saharan dust events identification to support ARPAB activities related to the application of the European directive for air quality (2008/50/CE) in Basilicata region. In such a joint activity, the Robust Satellite Technique (RST) approach has been assessed and tested as a decision support system for monitoring and evaluating air quality at local and regional level. In particular, RST-DUST products, derived by processing high temporal resolution data provided by SEVIRI (Spinning Enhanced Visible and Infrared Imager) sensor on board Meteosat Second Generation platforms, have been analysed together with PM₁₀ measurements performed by the ground-based stations operated by ARPAB. Such an inter-comparison was devoted to investigate possible PM₁₀ over-threshold occurrences and to better evaluate their possible causes (i.e. anthropogenic and/or natural sources). The analysis demonstrated the added value of an independent, automatic and unsupervised satellite based system (capable of discriminating over-threshold PM₁₀ data produced by natural source from the ones occurred because of anthropogenic causes) in supporting the decisions of the considered end-user (ARPAB) in a pre-operational context.