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# Space Monitoring of air pollution using satellite time series: from a global view down to local scale

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Assessment of air pollution has been performed by different means over the years and, recently, the use of satellite data for detecting and monitoring atmospheric pollution has received considerable attention especially for application in industrial and urban areas. Methods based on satellite data (such as Landsat TM, SPOT MODIS images) are focused on the estimation of aerosol optical thickness (AOT) that is a measure of aerosol loading in the atmosphere, and therefore, it is considered as the main significant parameter of the presence/absence of atmospheric pollutants. A higher AOT value expresses the degree to which aerosols prevent the transmission of light, therefore, higher columnar of aerosol loading means lower visibility and higher aerosol concentration
Several state-of-art aerosol retrieval techniques provide aerosol properties in global scale, as for example products from the Moderate Resolution Imaging Spectroradiometer (MODIS) on board the Earth Observing System (EOS) Terra and Aqua satellites. The current aerosol optical thickness (AOT) products from MODIS (available free of charge by the NASA web site) is 10 km. This product is suitable for global research, but it faces difficulty in local area research, especially in urban areas However, new aerosol retrieval algorithm for the (MODIS) 500m resolution data have been developed to retrieve aerosol properties over land, which helps on addressing the aerosol climatic issues in local/urban scale.
Over the years, several algorithms for determining the aerosol optical thickness have been developed using several approaches and satellite sensors including medium (Landsat; ASTER) and high resolution imagery (IKONOS and Quickbird).
A comparison of results from these methods and independent data sets has been performed in the Basilicata region in the framework of the MITRA project (ref). This research activity was conducted in order to analyze their temporal dynamics and reliability for systematically using them in operative applications. Next step of the project is oriented towards the identification, on the basis of satellite time series, of critical levels of the major atmospheric pollutants