

## **AIR QUALITY MONITORING DESIGN: OPTIMIZATION OF PM<sub>2.5</sub> NETWORKS USING SATELLITE OBSERVATIONS**

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### **ABSTRACT**

This paper presents an objective methodology for determining the minimum number and optimal configuration of air quality monitoring stations for the threefold objective of human exposure representation, compliance with air quality standards and depiction of general air pollution spatial-temporal patterns. The optimization goal is approached through the 'Gain of Information' concept, which is based on the environmental information associated with a candidate station and it is estimated over the 'Zone of Representativeness' of the station. The EU site class for each proposed monitoring location is identified, such as urban-, suburban- or rural- background. The methodology is applied to the design of a PM<sub>2.5</sub> monitoring network in a wide area in N. Italy, where no PM<sub>2.5</sub> monitoring stations exist and no fine particle emission inventory is available. PM<sub>2.5</sub> concentrations are, therefore, surrogated by the atmospheric particulate loading, estimated, after satellite image processing, in terms of the aerosol optical thickness.