REMOTE SENSING MEASUREMENTS FOR EVALUATION OF AIR QUALITY IN AN INDUSTRIAL SITE: IMPORTANCE OF THE METEOROLOGY

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In the last decade the remote sensing measurements have been widely developed for different reasons. Even if the equipment can be considered expensive, the results and the suitability are very interesting. In fact, first of all, it allows to measure conventional and no-stable pollutants like nitrous acid, and to take information on both the pollution dispersion and the chemical transformation and to evaluate different complex pollution phenomena like photochemical smog episodes, atmospheric acidity etc.. Now the climate monitoring by the measure of the primary and secondary pollutants defined conventional and of secondary organic pollutants called non conventional is considered the only way to evaluate the atmospheric pollution in a site. If we consider an industrial area where the parameters are much more consistent (like emissions, autovehicular traffic, etc.), the remote sensing measure begin so fundamental because we can monitor a wide area with this technique. Further, the meteorology appears immediately essential to understand the concentration levels and the dispersion power of the atmosphere. This group in collaboration with the Atmospheric Pollution Institute of the National Council of Research (IIA-CNR) has developed a methodology for the knowledge of the dynamic of the boundary layer (stability and instability conditions). This information is useful to evaluate the temporal-spatial evolution of the pollutant in the atmosphere.
ISPESL's air chemical laboratory has been involved in this field since long time: it is equipped with a Mobile Laboratory and a Differential Optical Absorption Spectrometry (DOAS) instrument is installed on the roof.
We present an important performance of this instrument showed during an intensive climate monitoring campaign in a large industrial area characterized by different strong pollution sources. We monitored the area with two DOASs: one was located at sea level and the second one was sited at 300 m-height a.s.l. in an area 10 km distant from the other. These two positions were studied to understand how the wind contribution influences the pollution levels. The results appear very interesting: in fact, the evolution of the remixing atmospheric conditions of the low boundary layer shows very well the strong dependence of the primary and secondary pollutant behaviour (especially for benzene) with the meteorological conditions.