



## Meteorological determinants of air quality

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Air quality is the result of complex phenomena, among which the major role is played by human emissions of pollutants. Atmospheric processes act as determinants, e.g., modulating, dumping or amplifying the effects of emissions as an orchestra's director does with musical instruments. In this work, a series of small-scale and meso-scale meteorological determinants of air-quality are presented as they are observed in an area characterized by complex orography (Friuli Venezia Giulia, in the north-eastern side of Italy). In particular, attention is devoted to: i) meso-scale flows favouring the persistence of high concentrations of particulate matter; ii) meso-scale periodic flows (breezes) favouring high values of particulate matter; iii) local-scale thermodynamic behaviour favouring high atmospheric values of nitrogen oxides. The effects of these different classes of determinants are shown through comparisons between anthropic emissions (mainly traffic) and ground-based measurements. The relevance of complex orography (relatively steep relieves near to the sea) is shown for the meso-scale flows and, in particular, for local-scale periodic flows, which favour the increase of high pollutants concentrations mainly in summer, when the breezes regime is particularly relevant.

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