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Organic compounds and PM at a background site in the Karst of Trieste: biogenic VOCs, secondary aerosol and oxidation processes

A study for characterizing organic compounds and secondary aerosols at a sampling site located in a rural background area in the Karst of Trieste was started in 2012. The site, called Borgo Grotta Gigante (Sgonico, TS), is located at 3 km from the sea in a woody karst area close to a meteorological station, 8 km far from Trieste (200.000 inh.), 20 km from Monfalcone (50.000 inh. considering its agglomerate), both industrial and harbour cities on the Northern Adriatic Sea. One primary aim of the study is the characterization of the influence of emissions of volatile organic compounds from local vegetation and transformation of these chemicals in the atmosphere, leading to biogenic secondary organic aerosol. The relative distance from intense pollution sources allows to study the macroconstituent of PM being characteristic for this coastal area and to verify the presence of regional and long-range transport phenomena. Biomass burning markers were detected during winter season.

A vegetation inventory of the site - characterized by a sub Mediterranean deciduous forest classified as *Ostrya-Quercetum pubescentis* - was prepared and matched with plant emission factors derived from literature so to have first approximation estimates of the most abundant BVOCs. Moreover quantitative analytical methods for the experimental determination of BVOCs and BSOA in PM₁₀, collected respectively by passive samplers and high volume sampler, were set up, also aiming to detect reaction products of organics with O₃, NO_x, SO₂ and radicals. Air and PM were sampled and analysed describing different seasonal situations. Further simulations on BVOCs and aerosols of natural origin in the area are provided by MEGAN (Model of Emissions of Gases and Aerosols from Nature) and point computational estimates are compared to experimental data. In order to get an insight on oxidation of organics semivolatiles, a field experiment was performed spiking deuterated PAHs on part of PM filters.

Working group IAS (WG1, WG2, WG3) o sessione speciale (SPR)

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