



## Venice under siege by biomass burning

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On January 5, the eve of Epiphany, as usual in parts of Europe, a holiday is traditionally celebrated in the Veneto Region by lighting of bonfires in the countryside from evening to midnight. Usually during that night Venice and its mainland Mestre (one of the most densely populated urban centres in the Veneto Region) fall in the plume of the widespread thousands combustion sources. Typically a shallow inversion layer leads the urban PM<sub>10</sub> atmospheric concentration to a peak of 250-300  $\mu\text{g}/\text{m}^3$  (on a two hours basis) the morning after. A singular windless period started just before the night of the last celebration (January 2007) and a four hours average PM<sub>10</sub> concentration of 470  $\mu\text{g}/\text{m}^3$  has been recorded between midnight and 4am. The severe impact of the bonfires gave rise even to indoor pollution complaints in the entire area, and in many monitoring sites of the province an average daily PM<sub>10</sub> greater than 200  $\mu\text{g}/\text{m}^3$  lasted for days. A description of the biomass burning aerosol properties monitored in Mestre, from the initial flaming phase to the overnight lasting smoldering of the bonfires, will be presented with a detailed time profiling (2 minutes) of CO, NO<sub>x</sub>, O<sub>3</sub>, SO<sub>2</sub>, particle number concentration (4nm - 3 $\mu\text{m}$  with a condensation particle counter Model 3775 from TSI) and the total Surface Polycyclic Aromatic Hydrocarbon concentration (SPA<sub>H</sub>, with a photoelectric aerosol sensor). Also the PM mass concentration (PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>7</sub>, PM<sub>10</sub>, TSP) have been recorded, with the same time resolution, using an optical particle counter (OPC, model AEROCET 531 from Metone). The commercial instrument has been custom upgraded with a sensor and heater to stabilise the relative humidity of the air sample before optical counting. The modified OPC PM<sub>10</sub> values ranging in a wide interval from 13 to 770  $\mu\text{g}/\text{m}^3$ , averaged over a 4 hours period, have been successfully compared ( $r^2 = 0.95$ ) with those obtained from gravimetric analysis of filter samples collected in parallel for 68 hours. Semicontinuous measurement of combustion related volatile organic compounds from gas chromatographic and multi-path DOAS analysers are complimentary.