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Role of fossil fuel and wood burning emissions on Volatile Organic Compounds, Carbon monoxide and Black Carbon level and variability as determined from one-year measurements in Paris.

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Within the French program PRIMEQUAL-FRANCIPOL 2010-2013, measurements of gaseous precursors of secondary organic aerosols have been performed at the LHVP (Laboratoire d'Hygiene de la Ville de Paris), an urban background site of Paris. A continuous real-time monitoring strategy using the high sensitivity PTR-MS (Proton Transfer Reaction- Mass Spectrometer) has been implemented for the measurements of Volatile Organic Compounds (VOCs) during a whole year (02/2010-03/2011). The data were acquired in mass-scan mode thus, allowing to follow a very wide range of analytes, namely between m/z 18 and 151. This broad range of compounds includes both well-known VOCs and less studied ones, providing a great exploration potential and the opportunity to establish novel valuable information. This unique dataset will enable to acquire a better understanding of the diurnal, weekday and seasonal trends and to determine the main sources that drive VOCs variability in Paris. The preliminary results herein aim to distinguish the biomass burning from the fuel fossil emissions and to evaluate their impact on the measured volatile organic compounds using tracers Black Carbon (BC) and carbon monoxide (CO). BC was measured and separated into fuel fossil (FF) and wood burning (WB) contributions which can both be used as tracers. The obtained FF contributions to BC are well correlated with measured concentrations of acetaldehyde (m/z 45), acetone (m/z 59), hexanal (m/z 83), probably chloroethane (m/z 85), dimethylbenzene (m/z 107) and trimethylbenzene (TMB) while WB contributions to BC correlate nicely with methanol and the mass 97, maybe related to furfural which has already been identified in smoke from woodburning.