

EGU21-15080

<https://doi.org/10.5194/egusphere-egu21-15080>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



High quality monitoring dataset needed for improving VOC emission knowledge in a Mediterranean port city

Marvin Dufresne^{1,2}, Thérèse Salameh¹, Thierry Léonardis¹, Grégory Gille³, Ludovic Lanzi³, Alexandre Armengaud³, and Stéphane Sauvage¹

¹IMT Lille Douai, Institut Mines-Télécom, Univ. Lille, Centre for Energy and Environment, F-59000 Lille, France

²French Environment and Energy Management Agency 20, avenue du Grésillé- BP 90406 49004 Angers Cedex 01 France

³Atmosud, Le Noilly Paradis 146 rue Paradis, 13006 Marseille, France

Volatile Organic Compounds (VOCs) play a key role in the atmospheric pollution, especially as they are precursors of secondary pollutants (ozone, secondary organic aerosols, etc.), and they are key tracers of many sources.. Previous studies in the Mediterranean region, which is a hotspot of air pollution and climate change, have shown a high organic pollution due to VOCs. Moreover, in the Western part of the Mediterranean, few studies have been conducted regarding VOCs despite frequent ozone pollution episodes still occurring especially in Marseille-France. Long-term high quality VOC datasets are therefore crucial for the evaluation of emission inventories used as inputs of the chemical-transport models. The objective of our work is to improve our knowledge regarding VOC source apportionment in Marseille with a focus on emissions related to shipping raising the need of high quality monitoring datasets. For the first time, a one year and half (March 2019 - August 2020) measurement campaign has been conducted in Marseille at an urban area representative site receiving air masses from the harbor. In addition to a large set of instruments, two on-line thermal-desorption gas chromatography flame ionization detector have been used for the continuous hourly measurement of 70 Non-Methane HydroCarbons (NMHCs) from 2 to 16 carbon atoms covering alkanes including IVOCs, alkenes, alkynes, aromatics. Here, we will focus on the metrological aspects of the analytical instruments (traceability, repeatability, etc.), intercomparison of common species measured with both instruments, as well as an intercomparison of several calibration methods developed for IVOC (C10 to C16) measurement. A special attention has been given to the uncertainty estimation following ACTRIS and WMO guidelines. Finally, we will show an overview of the Positive Matrix Factorization (PMF) model results, applied to a necessarily large robust dataset of observations with the associated uncertainties.