



The role of simulation chambers in the development of spectroscopic techniques: campaigns at EUPHORE

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Simulation chambers represent a very useful tool for the study of chemical reactions and their products, but also to characterize instruments. The development of spectroscopic techniques throughout the last decades has benefited from tests and intercomparison exercises carried out in chambers. In fact, instruments can be exposed to various controlled atmospheric scenarios that account for different environmental conditions, eliminating the uncertainties associated to fluctuations of the air mass, which must be taken into account when extrapolating results to the real conditions. Hence, a given instrument can be characterized by assessing its precision, accuracy, detection limits, time response and potential interferences in the presence of other chemical compounds, aerosols, etc. This implies that the instrument can be calibrated and validated, which allows to enhance the features of the instrument. Moreover, chambers are also the scenario of intercomparison trials, permitting multiple instruments to sample from the same well-mixed air mass simultaneously.

An overview of different campaigns to characterize and/or intercompare spectroscopic techniques that have taken place in simulation chambers will be given; in particular, those carried out at EUPHORE (two twin domes, 200 m³ each, Spain), where various intercomparison exercises have been deployed under the frame of European projects (e.g. TOXIC, FIONA, PSOA campaigns supported by EUROCHAMP-II). With the common aim of measuring given compounds (e.g. HONO, NO₂, OH, glyoxal, m-glyoxal, etc), an important number of spectroscopic instruments and institutions have been involved in chamber experiments, having the chance to intercompare among them and also with other non-spectroscopic systems (e.g. monitors, chromatographs, etc) or model simulations.