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Real-time measurement of reactive gases (NO, NO_2, O_3, CO) at ERSA, Cape Corsica, a long term Observatory.

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Important efforts have been put in 2012 in order to implement the infrastructure and instrumentation for a fully equipped background monitoring station at Ersa, Cape Corsica, key location at the crossroads of dusty southerly airmasses and polluted outflows from the European continent. The ERSA observatory is a french initiative within the framework of CHARMEX (Chemistry-Aerosol Mediterranean Experiment (ChArMEx, http://charmex.lsce.ipsl.fr/) and CORSICA (Centre d'Observation Régional pour la Surveillance du Climat et de l'environnement Atmosphérique et océanographique en Méditerranée occidentale (http://www2.obs-mip.fr/corsica) .

The measurements of the station include real-time measurement of reactive gases (O_3, CO, NO, NO_2), off-line VOC measurements (cylinders, cartridges), a broad spectrum of aerosol properties (chemical composition, ground optical properties, integrated and space-resolved optical properties , size distribution properties, mass, hygroscopicity as well as dry/wet depositions).

Among all the parameters, reactive gases are recognized as precursors of ozone and aerosol. The primarily emitted nitrogen oxides (NO_x=NO+NO_2) have a substantial impact on radical chemistry, ozone (O_3) formation and aerosol by their atmospheric oxidation to aerosol nitrate. Carbon monoxide (CO) is mostly primarily emitted from combustion processes, but it is also formed in substantial amounts from the oxidation of methane (CH4) and volatile organic compounds (VOCs). Due to its high global turn-over rates CO is a major O_3 precursor, and it has a strong impact on the oxidizing capacity and thus indirectly on the concentration of the climate gas CH4. O_3 is a climate gas itself, however, also strongly involved in NO/NO_2 partitioning and oxidizing capacity, thus coupling back on several photochemical processes. Accordingly, impacts on climate are multiple and rather complex. The understanding requires high quality, long-term observations of these reactive species.

We present here the first measurement of reactive gases (O_3, CO, NO, NO_2) obtained at ERSA, the new monitoring station at Cape Corsica.