



Carbon monoxide observations from ground stations over France and Western Europe: long trends in the free troposphere

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Although a trace gas, carbon monoxide (CO) plays an important role in climate forcing through its chemical interactions affecting methane (CH₄) and hydroxy radicals (OH) concentrations. As one of the main ozone precursor, CO was also identified as an important indirect greenhouse gas. Analysis of CO evolution in the troposphere is thus of primary importance.

The present study analyses an original set of CO measurements at 3 high altitude stations in France belonging to the PAES network (Pollution Atmosphérique à l'Echelle Synoptique, data freely available on <http://aero.obs-mip.fr/paes/>): the Pic du Midi (Pyrenees, PDM), the Col du Donon (Vosges) and the Puy de Dôme (Massif Central). Five another Western European high stations located in Germany, Switzerland and Austria are also included in this study.

CO trends have been evaluated since the 1990s for three alpine stations in Germany and Switzerland (Hohenpeissenberg, Zugspitze and Jungfraujoch) and since the 1980s for the PDM stations for which prior measurements between 1981 and 1983 have been analysed. In the alpine stations, a negative trend of 1 to 3.6 ppb/yr was found since the 1990s and of 0.9 ppb/yr at PDM since the 1980s. For PDM, it corresponds to a 10% decrease that overcomes the CO inter-annual variability, estimated to about 5% thanks to MOZAIC data. This decrease is primarily attributed to a decrease in CO sources at European scale, evaluated to about 45% since the late 1980s (Venstreng et al., 2004).