



## **Characterization of carbon monoxide distributions in the lower atmospheric layers during the 2003 heatwave over W. Europe: Assimilation of MOPITT data.**

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During the summer of 2003, Europe experienced one of its hottest periods more likely ever reported during the last 500 years [Luterbacher et al., 2004]. This heatwave period was long enough to very likely help the increase of uncommon boundary layer depth and resulted in the development of an exceptional photochemical pollution episode. Pollution in the planetary boundary layer (PBL) was significantly enhanced during the day.

Unusually high carbon monoxide (CO) concentrations originating mostly from local sources and to some extent from biomass burning due to numerous fires over the Northern Hemisphere, were measured by the Measurement Of Pollution In The Troposphere (MOPITT) instrument during the heatwave period.

In this study, we use the Météo-France comprehensive three dimensional chemistry transport model (CTM) MOCAGE and the MOCAGE-PALM assimilation system (Bousserez et al., 2007; Buis et al., 2006) for the analysis of carbon monoxide distributions over the Europe.

The MOCAGE model is driven by the ECMWF re-analysis meteorological fields and includes biomass burning emission from GFEDv3 to compute CO concentrations over the Europe domain at the horizontal resolution of  $0.2^\circ \times 0.2^\circ$ . This domain is a nested domain, which is controlled on the boundaries by the global model at the resolution  $2^\circ \times 2^\circ$ .

The latest version available of MOPITT CO data provides information in the lower layers on carbon monoxide distributions. The assimilation of this data, helped to better characterize the distribution of CO concentrations in the lower atmospheric layers, and quantitatively to assess the added value of the MOPITT instrument in our assimilation system.