

Sensitivity Study of Impact of Isoprene Emission Estimates on Modeled CO Concentration

K. Zemankova¹, C. Granier², I. Bouarar¹, O. Stein³ and M. Schultz³

¹LATMOS, Université Pierre et Marie Curie and Centre National de la Recherche Scientifique, Paris, France; +33 1 44 27 48 38, E-mail: katerina.zemankova@latmos.ipsl.fr

²LATMOS, Université Pierre et Marie Curie and Centre National de la Recherche Scientifique and Cooperative Institute for Research in Environmental Sci, Boulder, CO 80309

³Institute for Energy and Climate Research, Troposphere IEK-8, Research Center, Juelich, Germany

Impact of three global isoprene emission inventories estimated by the Model of Emissions of Gases and Aerosols from Nature (MEGANv2.1) Model on CO concentration was studied using the chemistry transport Model for Ozone and Related Chemical Tracers (MOZARTv3.5). One reference (REF) and two sensitivity isoprene datasets were calculated for the year 2008 using meteorological inputs from NASA's Modern-Era Retrospective Analysis for Research and Applications reanalysis. First sensitivity inventory entitled "SM" additionally accounted for the effect of water stress on isoprene emission, while second sensitivity dataset entitled "SW" employed a simplified parameterisation for photosynthetically active radiation. CO production in the global chemistry transport model MOZARTv3.5, when different isoprene emissions were included in the model inputs, was investigated. Special attention was paid to regions where substantial differences in isoprene emission scenarios can be recognized. Obtained results suggest linear relationship between isoprene emissions and CO concentration in the chemistry model outputs. Modeled CO concentrations were evaluated against measurements from the GMD/European Monitoring and Evaluation Programme stations and with the Measurements of Pollution in the Troposphere satellite retrievals.

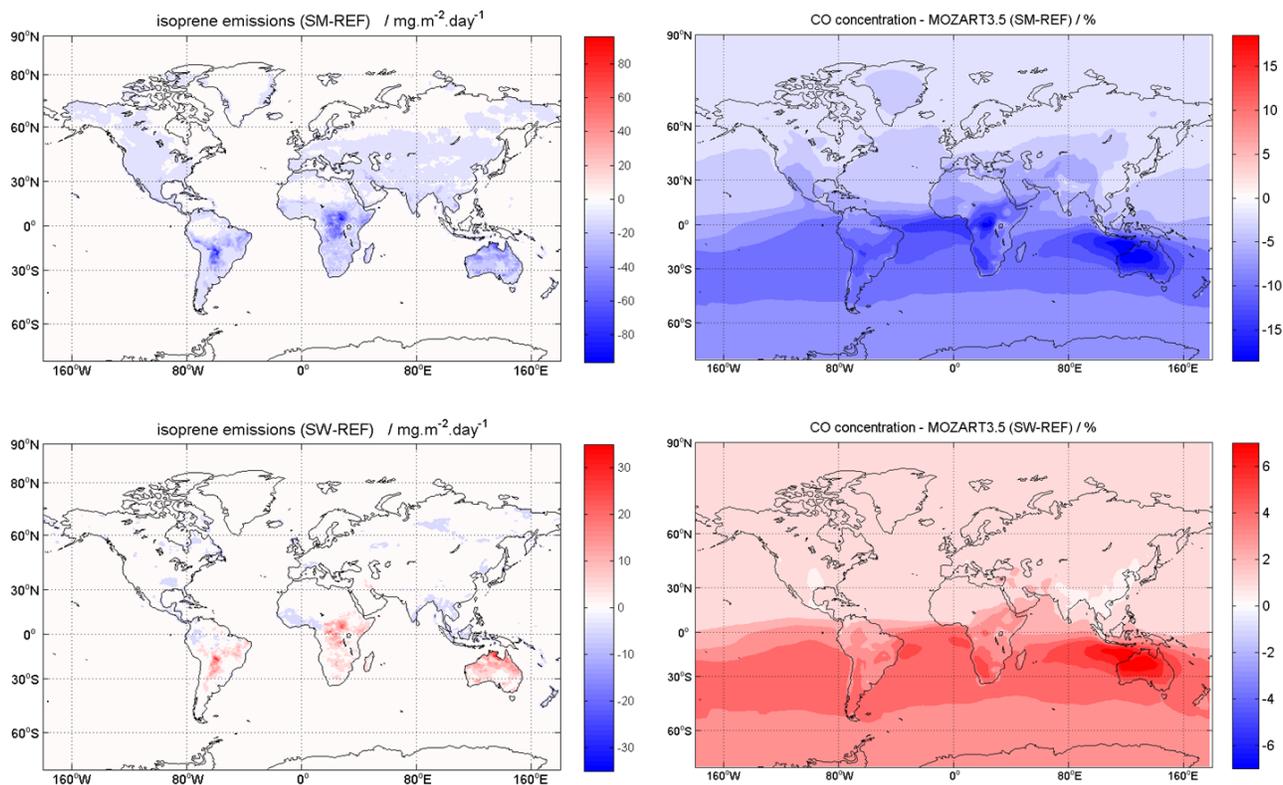


Figure 1. Difference in isoprene emissions (left column) and relative differences in CO concentrations (right column) calculated by MEGANv2.1 and MOZARTv3.5 models, respectively, in sensitivity runs SW and SM when compared to the reference model run REF.