



## **Carbon monoxide maximum over the zagros mountains in the middle east: signature of mountain venting?**

**J. Kar**, James R. Drummond, D. B. A. Jones, J. Liu, F. Nichitiu, J. Zou

Department of Physics, University of Toronto, Toronto, Canada  
(jkar@atmosp.physics.utoronto.ca)

Carbon monoxide (CO) is an important trace gas insofar as it influences atmospheric chemistry through its reaction with the OH radical. It also provides valuable information on the dynamical properties of the atmosphere, because of its long lifetime (few weeks to 2 months). The Measurements of Pollution in the Troposphere (MOPITT) instrument has been providing global measurements of vertical profiles of CO since March, 2000, at a horizontal resolution of 22x22 km<sup>2</sup>. We present observations of a layer of enhanced CO mixing ratios in the upper troposphere over the Middle East in spring and summer. An intriguing feature of this enhanced CO layer is that it is correlated with local topography over the Zagros mountain range of Iran. The feature is seen in all the years of available MOPITT data. Further, the analysis of the MOPITT averaging kernels indicate that the retrievals can distinguish between the upper and middle tropospheres and do not reveal any data artifacts in this region. We argue that this enhanced CO over the Zagros range is likely due to a combination of orographic lifting of local boundary layer air and large-scale subsidence of polluted air, transported into the region in the upper troposphere. We discuss the implications of this phenomenon for the previously observed tropospheric ozone maximum over the middle east during the summer.