Geophysical Research Abstracts,
Vol. 11, EGU2009-670, 2009
EGU General Assembly 2009

Tropospheric CO Observations Using IASI datasets and an Optimal Estimation Retrieval Method

SM Illingworth
University of Leicester, Leicester, UK

Carbon monoxide (CO) in the troposphere acts as a marker of large-scale influences of pollution on both the regional and global scale, whilst acting as a reference source for incomplete combustion. Through its reactions with the hydroxyl radical OH, the concentration of CO is also related to the oxidizing capacity of the troposphere, hence providing a chemical marker for the "local" chemical environment and its state. Investigations into perturbations of the sources, sinks and net surface fluxes of CO are therefore of increasing importance. CO exhibits strong locally elevated concentrations in the vicinity of sources due to its relatively short life time of weeks to months. Global measurements of CO from satellites will therefore allow to identify the main source regions and to quantify their source strength.

The Infrared Atmospheric Sounding Interferometer (IASI) is a high-resolution (0.25 cm-1 unapodized) Michelson interferometer which was launched in 2007 on the European polar Meteorological Operational Platform (METEOP-1) satellite. The IASI instrument has a swath of about 2200 km, ensuring 99% global coverage twice a day, and is the first of a series of three instruments launched every five years, ensuring a continuity of data for a planned period of 15 years. The IASI instrument thus offers the possibility of high-spectral resolution infrared monitoring of CO over a very long time period.

This work presents a new Optimal Estimation Method (OEM) retrieval of CO profiles in the mid-troposphere from observations of the IASI instrument. First retrieval results, as well as a validation of these results with ground-based sites and other satellites are included, and error characterization as well as the effects of noise in the retrievals is also discussed.