Geophysical Research Abstracts, Vol. 7, 06671, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06671

Ground-based FTIR measurements of CO from Kiruna (Sweden) and Izaña (Tenerife Island, Spain): characterization and comparison with MOPITT data

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Solar absorption measurements using Fourier transform infrared (FTIR) spectrometry have been made by IMK since many years at two stations of the NDSC (Network for the Detection of Stratospheric Change); Kiruna (Sweden, 68˚N, 20˚E, 420 m a.s.l.), and Izaña (Tenerife, Spain, 28˚N, 16˚W, 2360 m a.s.l.). Time series of total column amounts and vertical profiles of CO have been derived from these measured spectra in Kiruna since 1996 and in Izaña since 1999.

This work focuses on the comparison of CO data between the two stations, covering the polar and the subtropical region. The existing spectral time series have been reanalyzed according to a common optimized retrieval strategy, in order to derive distinct tropospheric and stratospheric abundances of CO. In parallel, the FTIR total column amounts have been compared to CO columns derived from the MOPITT (Measurement Of Pollution In The Troposphere) instrument for the period March 2000 to October 2003. Ground-based FTIR measurements are particularly suitable to validate satellite data, because CO abundances could be measured with high accuracy. The mean difference is 11% and 8% for Kiruna and Izaña respectively.