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The following information applies to MOPITT level 2 (L2) data, version 4.6.2  
March 2000

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## CO vertical profiles and estimated total columns

### Geographical coverage and altitude range and time coverage

The daytime and nighttime CO profiles (L2-product, v.4.6.2) are retrieved on the 6 standard MOPITT pressure levels: 850, 700, 500, 350, 250, 150 mb and correspond to the global clear sky measurements between 65° S and 65° N. The horizontal footprint of the individual MOPITT retrieval is 22 by 22 km. For given day, depending on the clearness of the sky the MOPITT provide opportunity to retrieve from 5000 to 100000 vertical profiles.

During March 2000, there were 19 days for which the MOPITT CO data are available: 03/03, 04/03, 05/03, 06/03, 07/03, 12/03, 13/03, 14/03, 15/03, 16/03, 18/03, 24/03, 25/03, 26/03, 27/03, 28/03, 29/03, 30/03, 31/03.

### Units

Units for the CO profile values are ppbv, and mol/cm<sup>2</sup> for the corresponding total columns. The CO total column is calculated from a 35 level representation of the profiles employed by the retrieval forward model using the corresponding temperature and surface pressure fields from the NCEP archived history tapes.

### Estimated errors and averaging kernels

For CO vertical profiles, precision information is available in the "Error\_Retrieved\_CO" fields (on the same 6 pressure levels) of the L2-files. These values depend on the smoothing error, model parameter error, forward model error, and error due to instrument noise (Rodgers, 1995). The major error is expected to be due to smoothing error. Additional specification of the error retrievals can be found in the "CO\_retrieval\_error\_covariance" field of the L2-files. Knowledge of this quantity along with the MOPITT a priori CO profile and a priori error covariance matrix allow us to calculate the MOPITT averaging kernels for given retrieved profile. In order to make adequate comparison between the MOPITT CO retrievals and other correlative measurements and models we recommend following up the procedure of the [application and calculation of the averaging kernels](#). Users of the MOPITT data can easily estimate the relative error of the given CO retrieval. During the March 2000, for a given day about the 15-25% of the total profiles have relative errors higher than 20% at 500 mb. We recommend carefully inspect those profiles in the course of the MOPITT data use.

### Caveats, and "bad" data flag.

If at some geographical points the surface pressure (for example, for mountainous terrain) is lower than the MOPITT pressure levels then the bad data (nodata) flag, the "-9999" value, is assigned to those points. In this first public version of the L2-CO product, the MOPITT science team does not provide a definite range for the minimum and maximum CO values outside of which, the data should be considered suspicious or reflect poorly constrained retrievals. However, we recommend that CO profiles that have values as low as 5 ppbv be disregarded, and critical attention be paid to those MOPITT retrievals which report the CO value less than 30-40 ppbv at the 500 mb pressure level.

### Systematic effects.

The validation of the MOPITT CO data and investigation of possible biases as a reflection of some systematic retrieval errors in the CO L2-fields are still underway.