

MOPITT V6 Level 1 Data Quality Summary

The following information applies to MOPITT Level 1 (L1) data, Version 6 (V6; L1V3.42)
May, 2014

CO Channel Radiances

Achieving the highest quality MOPITT carbon monoxide (CO) retrievals requires a thorough understanding of the errors that characterize MOPITT's Level 1 calibrated radiances.

Geolocation Bias. A small systematic error in the MOPITT geolocation values (latitude and longitude) has been identified which affects previous (V3, V4 and V5) MOPITT operational products (including Level 1 products), but has been corrected for V6. More information is available on the MOPITT website (<https://www2.acd.ucar.edu/mopitt>).

Long-term Instrumental Degradation. Long-term gradual changes in the temperatures and pressures of the MOPITT gas correlation cells can potentially bias the MOPITT radiances (relative to the operational radiative transfer model) and therefore produce retrieval biases. Beginning with the Version 5 release, the operational radiative transfer model explicitly represents this effect, and therefore no retrieval bias should result. More information on this effect is included in the Version 5 validation paper (Deeter, M. N., et al., 'Validation of MOPITT Version 5 thermal-infrared, near-infrared, and multispectral carbon monoxide profile retrievals for 2000–2011,' *Journal of Geophysical Research: Atmospheres*, doi:10.1002/jgrd.50272, 2013).

Radiance Bias Correction. Static radiance bias correction factors are employed in the MOPITT Level 2 processor to account for unresolved biases between the MOPITT Level 1 radiances and the operational radiative transfer model. More information on this correction method can be found in the to-be-published validation paper: 'The MOPITT Version 6 Product: Algorithm Enhancements and Validation.' After publication, citation information for this paper will appear on the MOPITT website (<https://www2.acd.ucar.edu/mopitt/publications>).

Methane Channel Radiances

Methane (CH₄) channel radiances are not available in the V6 Level 1 product.