MOPITT V1 Level 1 Data Quality Summary

This statement applies to Level 1 Version 1 data (Local Version ID 2.19.3)
October 20, 2000

There has been no previous heritage instrument with which MOPITT can easily be compared. Therefore validation is a challenge. The data released are in the preliminary stages of calibration and validation. Significant improvements are expected as the MOPITT team better characterizes the instrument's in-flight behavior and the validation campaign progresses.

Known problems:

1. Thermal Channel Filter Shifts
   A systematic discrepancy between the expected (i.e. calculated) Average radiances and the observed radiances was detected (~7%) in the thermal channels. The source of this discrepancy is believed to be caused by a shift of the optical filters of a few wavenumbers. The cause of the shift is believed to be a combination of thermal effects and possibly errors in measuring the filter position and shape. The magnitude of the shift is being estimated empirically and corrected for in the processing software. These data are the first attempt at rectifying this problem. The discrepancy in these data for the thermal channels has been reduced to less than 1% in the inner pixels. Refinements are expected.

2. Inner/Outer Pixel Contrast
   MOPITT has an array of four pixels in a line. It appears that the inner two pixels of the line register slightly higher radiances than the outer two pixels. This effect is being investigated. Future releases will attempt to correct this bias.

3. Solar Channel Filter Shifts
   There are known differences between the best estimates of the filter positions in the 2.2 and 2.3 micron bands and the positions implemented in the processing software. This is not expected to have a major effect on results, and will be corrected in future versions.

4. Solar Channel Radiance Variations
   The observations of land (as opposed to ocean) are quite variable over the course of a MOPITT stare. This may introduce errors that more clever processing algorithms may reduce or avoid.

5. Noise Values
   Noise values are estimates, rather than calculations based on the data. These are in the process of being incorporated.

6. Validation Data
   There are no independent observations of MOPITT radiances. Validation experiments, especially based on the MOPITT-Airborne Simulator (MOPITT-A) which flew on the NASA ER-2 aircraft during the SAFARI Program in Southern Africa, are now taking place. Validation is also being carried out through comparison with calculations based on in situ measurements. The results are slowly being assimilated by the MOPITT science team. More time is needed to take advantage of the independent corroborative data.