

CMDL Correlative Measurements in Support of MOPITT Validation

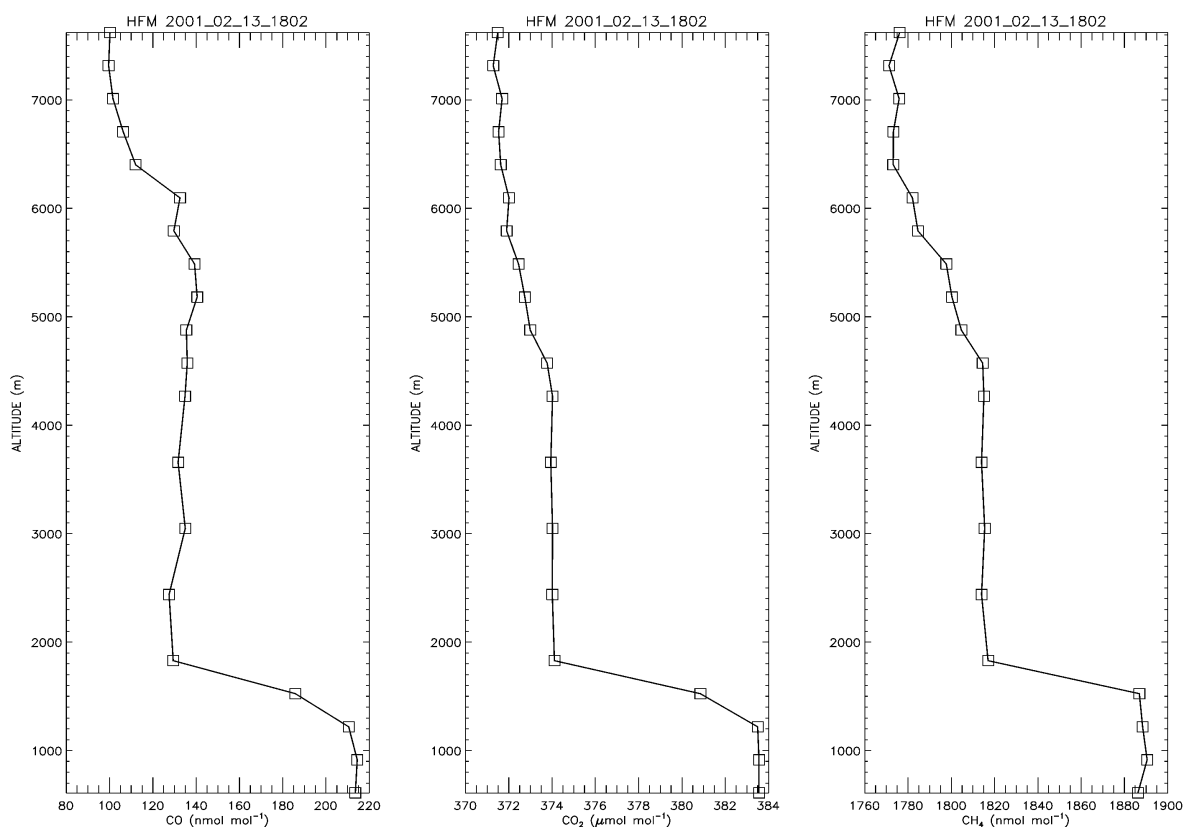
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The Measurement Of Pollution In The Troposphere instrument (MOPITT) is a gas filter correlation radiometer containing both pressure and length modulated gas cells. Flown aboard the EOS TERRA satellite, MOPITT measures the distribution of carbon monoxide (CO) and methane (CH₄) in the troposphere and lower stratosphere. Information on the vertical distribution of CO can be extracted from radiance data acquired by different instrument channels. As part of the MOPITT validation program,



CMDL has determined vertical profiles of CO, CH₄, and other radiatively important trace gases at five globally distributed sites: Poker Flats, Alaska; Harvard Forest, Massachusetts, Carr, Colorado; Molokai, Hawaii, and Rarotonga, Cook Islands. Using portable sampling equipment and chartered aircraft, profiles of selected trace gases, extending from ~500 m to 7-8 km above sea level, are determined approximately twice per month. The profiles show latitudinal and temporal variations that are generally consistent with surface measurements. Strong correlations in the vertical are often seen between CO, CO₂, and CH₄ mixing ratios. Apparent enhancements in mixing ratios are sometimes traceable to regions of anthropogenic emissions. More often, however, isentropic back trajectories fail to indicate the source of elevated trace gases. Preliminary comparisons have been made between MOPITT level 1 product (radiances) and forward radiative transfer model-generated radiances based on the CMDL profiles and relevant ancillary data.