

5.064 A Reanalysis of MOPITT-CO observations .

Early Career Scientist

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Abstract:

Carbon Monoxide is a key component in tropospheric chemistry. It plays an important role by affecting the oxidative capacity through its loss with OH and being a precursor of tropospheric ozone. Both meteorological observations and multispectral retrievals of CO partial columns obtained from the MOPITT (Measurement of the Pollution in the Troposphere) instrument have been assimilated into the Community Atmosphere Model with Chemistry (CAM-CHEM), the atmospheric component of the Community Earth System Model (CESM). The assimilation is carried out using an Ensemble Adjustment Kalman Filter algorithm within the Data Assimilation Research Testbed (DART) package. We investigate the causes of the CO trends by analyzing chemical fluxes and CO emission tags spatio-temporal distribution and long-term trends. In particular, we discuss the assimilation results with regards to the oxidative capacity (i.e., OH distribution, methane lifetime) together with CO and O₃ chemical production and losses. The results are compared to independent in-situ observations (e.g. MOZAIC-IAGOS aircraft observations, WDCGG surface measurements) as well as a CAM-Chem control run forced by MERRA reanalysis.