

# Answering the call for "model-relevant" observations of aerosols and clouds

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We describe a technique for combining multiple A-Train aerosol data sets, namely MODIS spectral AOD (aerosol optical depth), OMI AAOD (absorption aerosol optical depth) and CALIOP aerosol backscatter retrievals (hereafter referred to as MOC retrievals) to estimate full spectral sets of aerosol radiative properties, and ultimately to calculate the 3-D distribution of direct aerosol radiative effects (DARE). We present MOC results using almost two years of data collected in 2007 and 2008, and show comparisons of the aerosol radiative property estimates to collocated AERONET retrievals.

We compare the spatio-temporal distribution of the MOC retrievals and MOC-based calculations of seasonal clear-sky DARE to values derived from four models that participated in the Phase II AeroCom model intercomparison initiative. Comparisons of seasonal aerosol property to AeroCom Phase II results show generally good agreement – best agreement with forcing results at TOA is found with GMI-MerraV3.

We discuss the challenges in making observations that really address deficiencies in models, with some of the more relevant aspects being representativeness of the observations for climatological states, and whether a given model-measurement difference addresses a sampling or a model error