



Constraining aerosol radiative forcing – is urban outflow special?

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Experiments like the Megacity Initiative: Local and Global Research Observations (MILAGRO) have provided measurements of shortwave aerosol radiative properties in and around megacities that are highly variable over time, space, and wavelength. In contrast, the radiative effect of these aerosols seems to be much better constrained: We analyzed the relative solar spectral radiative forcing efficiency (aerosol radiative effect, normalized by aerosol optical thickness and incident solar irradiance) from aircraft measurements during MILAGRO and found only little variability of this quantity for a range of cases. These findings are based on measurements of the Solar Spectral Flux Radiometer (SSFR) and the Ames Airborne Tracking Sunphotometer (AATS-14) on the NASA J-31. A new technique allows the retrieval of the forcing efficiency above and below an aerosol layer not only over ocean but also over land. We compare aerosol forcing efficiencies and other radiative properties of Mexico City urban outflow over land and ocean and put it in perspective to other experiments in other regions of the globe. Based on examples, we discuss how much and which information is required for an aerosol layer to determine its effects from a radiative energy budget point of view.