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P-1 Linking AOD from Satellites to Surface $PM_{2.5}$ over the Eastern US Using Aircraft Observations

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A means to sense surface $PM_{2.5}$ levels from space would be a great help to Air Quality Community and requires linking surface $PM_{2.5}$ to aerosol optical properties and integrated extinction (aerosol optical depth or AOD) readily sensed from space. In the eastern United States, this should be straightforward, since the aerosol is relatively spatially homogeneous, is of the right size to scatter efficiently, and is comprised of sulfate and other anthropogenic compounds readily measured, although changes in relative humidity can confound retrievals. To link the satellite-observed AOD to the surface $PM_{2.5}$, aircraft observations of aerosol scattering and absorption were conducted over air quality monitoring sites with surface $PM_{2.5}$ measurements in the Eastern Shore in summer 2013 and 2104. Initial analysis shows that the integrated aerosol extinction within the aerosol layer observed by the aircraft is highly correlated with the $PM_{2.5}$ concentration observed at the surface. A better correlation was found between the surface $PM_{2.5}$ concentration and the averaged aerosol scattering in a layer close to the surface. Concurrent VIIRS satellite AOD observations are compared to the aircraft observations of AOD (integrated scattering and absorption). Conditions with good correlation between the satellite AOD and surface $PM_{2.5}$ were identified.