Quantification of Uncertainties in OCO-2 Measurements of XCO$_2$: Simulations and Linear Error Analysis


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Supplementary Material:

The following figures show the sensitivity of retrieved XCO$_2$ to interference error caused by aerosol. Five composite aerosol types are shown, dust (DU), sea salt (SS), black carbon (BC), organic carbon (OC), and sulfate (SO). Each aerosol is considered separately in 2 layers, at $\sigma = 0.95$ and $\sigma = 0.5$. See section 3.3.1 of the paper for details of the aerosol definitions and calculations.

In the figure labels, interference in the lower layer is referred to as ‘Interference_1’ while the upper layer is ‘Interference_2’. All figures show the response of XCO$_2$ to an error, or variability, of AOD = 0.1 in the relevant layer and aerosol type. All figures are plotted on the same scale and with the same color sequence, to aid comparability.
Figure 1. Dust (DU) in the layer surface - 750 hPa
Figure 2. Dust (DU) in the layer 750 hPa – top of atmosphere
Figure 3. Sea salt (SS) in the layer surface - 750 hPa
Figure 4. Sea salt (SS) in the layer 750 hPa – top of atmosphere
Figure 5. Black carbon (BC) in the layer surface - 750 hPa
Figure 6. Black carbon (BC) in the layer 750 hPa – top of atmosphere
Figure 7. Organic carbon (OC) in the layer surface - 750 hPa
Figure 8. Organic carbon (OC) in the layer 750 hPa – top of atmosphere
Figure 9. Sulfate (SO) in the layer surface - 750 hPa
Figure 10. Sulfate (SO) in the layer 750 hPa – top of atmosphere