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Testing of a global carbon cycle model that includes Carbonyl Sulfide (COS)

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Recent plant chamber and ambient atmospheric measurements suggest that atmospheric carbonyl sulfide (COS) may be a useful tracer for carbon cycle processes. We have included a mechanistic representation of COS exchange by leaves and soils in SiB3, a land-surface/carbon-cycle model. SiB generated COS and CO_2 fluxes were used together with other information on sources and sinks to simulate time series of the concentration of COS and CO_2 in the global atmosphere with chemical transport models. Here, we describe our parameterization of COS exchange in SiB3 and compare our meso-scale and global-scale simulations of COS and CO_2 concentrations to observations at 13 NOAA background atmospheric sites and many points in the free troposphere and the marine and continental boundary layers sampled by aircraft campaigns (NOAA, INTEX-NA and TC4).