

## Virtual ACOM Seminar

# Global Trends in Carbonyl Sulfide from 22 NDACC Stations

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Links: <https://operations.ucar.edu/live-acom>

### ABSTRACT

Carbonyl sulfide (OCS) is a non-hygroscopic largely inert trace specie in the free troposphere and is primary reservoir of sulfur maintained in part from the oxidation of other sulfur-containing source species. Its relatively long lifetime of 2-3 years makes it the largest source of sulfur transported into the stratosphere during volcanically quiescent periods. Using data from 22 ground-based globally dispersed remote sensing observation sites, we derive trends in the total OCS burden and partial columns in the free troposphere and stratosphere. These data are derived from high spectral resolution middle infrared (MIR) spectra are recorded by solar-viewing Fourier transform interferometers (FTIR) that are independently operated as part of the Network for the Detection for Atmospheric Composition Change (NDACC). The time series start date varies by station, the earliest beginning in 1985 and continue through 2020. Time series of total columns show an annual cycle that vary with latitude due in part to seasonal variation of the tropopause height and production and uptake of OCS at the surface. Course vertical information in the retrieved profiles of OCS are segmented by altitude, into lower tropospheric (LT), free tropospheric (FT) and lower stratospheric (LS) partial columns. Trends are found to have fairly well-defined inflection points revealed in computed anomalies during the up to 30 year time span. The most recent linear trends since ~2008 - 2018 show increases in nearly all latitudes and altitude ranges of 0.4 - 0.8 %/yr. 2018 appears to demark another change in trend.