

6.169 Long term trends in atmospheric composition from Australian ground-based remote sensing measurements.

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Abstract:

Remote sensing measurements of spectra in the mid infrared from a high resolution Fourier Transform Spectrometer (FTS) have been routinely collected from the campus of the University of Wollongong (UoW, lat -34.41, long 150.88E, alt 30 m) over a 20 year period. This measurement programme at UoW is part of the world-wide Network for the Detection of Composition Change (NDACC), a global network of stations using a range of remote sensing and in-situ measurement techniques. The mid-Infrared spectra recorded with the FTS, by its very nature captures the absorption information in the column from the ground to the top of the atmosphere. The spectra contain absorption features from many gases, most of which have some importance to chemistry and transport in the stratosphere (O₃, HCl, ClONO₂, HF), and troposphere (CO, HCN, NH₃, CH₄, CFC's, OCS, ...).

The physics of the spectral absorption is such that there is some vertical information inherent in the spectra, depending on where the particular species resides in the atmosphere and its concentration. The UoW dataset, like many within the NDACC, therefore contains a very valuable long term record of a range of processes throughout the atmosphere. This dataset has been recently analysed in a methodical and consistent manner, using NDACC recommended analysis procedures. This data will be discussed and important features highlighted that demonstrates its current and future contributions to the understanding of quite broad scientific questions covering air quality, long range transport of pollutants, the importance of volatile organic compounds (for example HCHO), and trends in stratospheric Cl and its impact on O₃.