Title: Readme for CH4-N2O-CO-QCLS data

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Data Set Overview:
These files contain 1-second measurements of methane, nitrous oxide, and carbon monoxide made with the Harvard/Aerodyne/NCAR QCLS instrument onboard the NCAR GV aircraft during the ORCAS campaign (January-February 2016).

Instrument Description:
The QCLS instrument works based on direct absorption spectroscopy. Details on operation of the instrument and in-flight performance can be found in the following two references:

Santoni GW, Daube BC, Kort EA, Jimenez R, Park S, Pittman JV, Gottlieb E, Xiang B, Zahniser MS, Nelson DD, McManus JB, Peischl J, Ryerson TB, Holloway JS, Andrews AE, Sweeney C, Hall BD, Hintsa EJ, Moore FL, Elkins JW, Stephens BB, Wofsy SC, *Evaluation of the Airborne Quantum Cascade Laser Spectrometer (QCLS) measurements of the carbon and greenhouse gas suite– CO_2, CH_4, N_2O, and CO – during the CalNex and HIPPO campaigns*, Atmos. Meas. Tech., 7, 1509-1526, doi:10.5194/amt-7-1509-2014, 2014.

Kort EA, Wofsy SC, Daube BC, Diao M, Elkins JW, Gao RS, Hintsa EJ, Hurst DF, Jimenez R, Moore FL, Spackman JR, and Zondlo MA, *Atmospheric observations of high latitude Arctic Ocean methane emissions up to 82°north*, Nature Geoscience, 5, 318-321, doi:10.1038/ngeo1452, 2012.

Data Collection and Processing:
Details on data collection methods can be found in the above references.

Data Format:
The .GV files are ASCII files that follow an ICARTT format where the header contains essential information about the data collected, date of collection, and most recent date of processing.

Data Remarks:
Data is all on the WMO scale for each gas. This version of the data has had all the spectra re-fit with correct temperature and pressure. Updated calibration values have been applied along with optimization of calibration window selection. Time periods which exhibited evidence of leaks or poor calibrations have been removed. This data is appropriate for scientific use. There may be subsequent updates to the data, so it is recommended to contact the PI, Eric Kort, to ensure you have the most recent calibrated data.

References:
Santoni GW, Daube BC, Kort EA, Jimenez R, Park S, Pittman JV, Gottlieb E, Xiang B, Zahniser MS, Nelson DD, McManus JB, Peischl J, Ryerson TB, Holloway JS, Andrews AE, Sweeney C, Hall BD, Hintsa EJ, Moore FL, Elkins JW, Stephens BB, Wofsy SC, *Evaluation of the Airborne Quantum Cascade Laser Spectrometer (QCLS) measurements of the carbon and greenhouse gas suite– CO_2, CH_4, N_2O, and CO – during the CalNex and HIPPO campaigns*, Atmos. Meas. Tech., 7, 1509-1526, doi:10.5194/amt-7-1509-2014, 2014.
Kort EA, Wofsy SC, Daube BC, Diao M, Elkins JW, Gao RS, Hintsa EJ, Hurst DF, Jimenez R, Moore FL, Spackman JR, and Zondlo MA, *Atmospheric observations of high latitude Arctic Ocean methane emissions up to 82°north*, Nature Geoscience, 5, 318-321, doi:10.1038/ngeo1452, 2012.