

## **Title: README for gas-phase C<sub>2</sub>H<sub>6</sub> data**

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## **1.0 Data Set Description**

Final data for gas-phase ethane (C<sub>2</sub>H<sub>6</sub>) measurements collected aboard the University of Wyoming King Air aircraft during phase 1 of the TRANS<sup>2</sup>AM field campaign. C<sub>2</sub>H<sub>6</sub> data status is final data - revision R0. Data are collected and reported at 1 Hz.

The base of operations for the UWKA aircraft during the TRANS<sup>2</sup>AM field campaign was Laramie Airport in Laramie, WY (KLAR). Phase 1 of the field intensive took place in August and September 2022.

Use of data require prior okay from data authors (please see list above).

## **2.0 Instrument Description**

Gas-phase C<sub>2</sub>H<sub>6</sub> measurements were collected in-situ using a commercial Aerodyne QC-TILDAS. The C<sub>2</sub>H<sub>6</sub> instrument was connected to a bypass manifold downstream of a Picarro G2401-m. The instrument also shared a pumping system with the NH<sub>3</sub> and HNO<sub>3</sub> QC-TILDAS instruments. The instrument is calibrated using a commercially available ethane standard diluted with ultra high purity zero air and a high precision standard near ambient air concentrations purchased from NOAA's GMD facility. Calibrations were performed before and after the campaign. The instrument is routinely zeroed on the ground and in flight by overblowing the inlet with a supply of ultra high purity zero air. The excess zero air is vented through the bypass manifold. For more details of the aircraft instrument set up, please see these reference listed below. The in-flight 1-s precision for the instrument is 80 pptv.

## **3.0 Data Collection and Processing**

C<sub>2</sub>H<sub>6</sub> data are collected and reported at 1-Hz. C<sub>2</sub>H<sub>6</sub> data are reported in units of ppbv (parts per billion by volume)

## **4.0 Data Format**

1-Hz C<sub>2</sub>H<sub>6</sub> data files are reported in ICARTT format. C<sub>2</sub>H<sub>6</sub> data are reported on the UWKA time base. Missing data due to in-flight zeros and laser position calibrations are flagged as -9999.

## **5.0 Data Remarks**

Use of data require prior okay from data authors (please see list above).

## **6.0 References**

Pollack, I. B., McCabe, M. E., Caulton, D. R., Fischer, E. V. (2022) Enhancements in Ammonia and Methane from Agricultural Sources in the Northeastern Colorado Front Range Using Observations from a Small Research Aircraft, *Environmental Science & Technology*, <https://pubs.acs.org/doi/10.1021/acs.est.1c07382>.