TI3GER-NONO2O3_GV

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1.0 Data Set Description:

Introduction

The instrument used for these measurements was the ACOM 2ch chemiluminescence NONO2 instrument and the HAISS FastO3 chemiluminescence. The instrument operated reliably for the entire campaign.

The inlet used was a HIMIL with a ¼" OD UHP tubing (22UHP.156X.250, AMETEK) ending with a 45° cut with the tall side facing forward to avoid aerosol particle ingestion in the inlet tubing. The length of this tubing was 36 cm. Right inside the cabin the ¼" OD was converted to 3/8" OD UHP tubing (22UHP.250X.375, AMETEK) for a length of 70 cm. At this point the sample flow rate was the sum of the NO, NO_2 and O_3 sample flow rates (935 sccm, 935 sccm, and 256 sccm respectively). Behind this point (top of L5 rack) the pressure was controlled at 80 Torr with an MKS 248 valve. After the MKS 248 valve the flow was split between NO, NO_2 and O_3. The sample air for Fast O_3 had to travel through an additional 140 cm of 1/4" OD UHP tubing to reach the instrument that was located in the same rack as the Picarro and Aerodyne (L4).

For NO_2 we used a large photolysis cell located in the L5 rack, cooled with dry ice. The conversion was achieved by using LED emitting at a wavelength of 395 nm. The conversion efficiency was typically larger than 85%.

Data version number and date

R0, 2022/11/02

Data Status

Final

Time period covered by the data

From 2022/03/30 to 2022/04/30

Physical location

GV based in Kona, Hawaii

Data Frequency

1 Hz, 10 Hz available for O3

Data source

ACOM 2ch NONO2 chemiluminescence and HAISS Fast O_3

Web address references

https://www.eol.ucar.edu/field_projects/ti

Data set restrictions

Contact the PI before using the data.

2.0 Instrument Description

See above

3.0 Data Collection and Processing

The NO NO_2 data are first background subtracted using the zeros made inflight, then a calibration factor is applied to convert from cps to ppt. The calibration factor is determined by calibrations carried out in flight. The Fast Ozone data are similarly background subtracted and multiplied by calibration factor, however in this case the calibration is carried out on the ground before and after the project.

4.0 Data Format

ICARTT

5.0 Data Remarks

None at this point.

6.0 References

Ridley, B. A., & Grahek, F. E. (1990). A small, lowflow, high sensitivity reaction vessel for NO chemiluminescence detectors.Journal ofAtmospheric and Oceanic Technology,7(2), 307–311.