WINTER CO, CO_2, and CH_4 observations

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Carbon Dioxide and Methane by Cavity Ringdown Absorbance Spectroscopy

Picarro G1301-f WS-CRDS

Precision (0.2-s averaging time):

250 ppbv CO_2

3 ppbv CH_4

3-5 Hz freq response, depending on inlet configuration

Archived data resolution: 1 s, high rate as requested

Accurate measurement requires removal of ambient water vapor, an may further degrade time response

Carbon Monoxide by VUV Fluorescence

Aero-Laser 5002 VUV resonance fluorescence

2 ppbv precision (1-s averaging time)

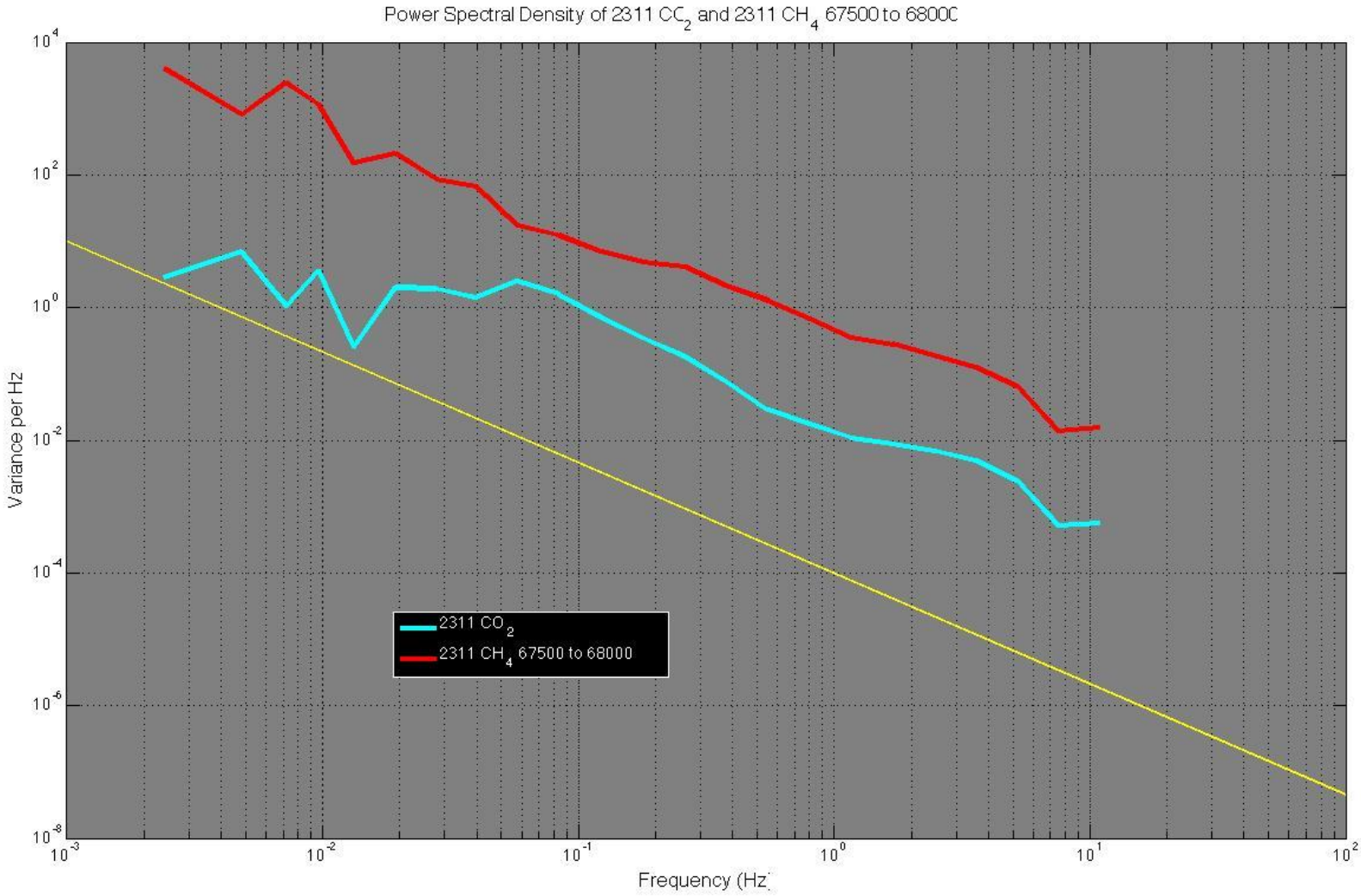
.5-Hz freq response

Archived data resolution: 1 s

2 ppbv ± 3% accuracy

Data: Field and Final Quality

- Real time preliminary data
  - CO: constant linear coefficients; preliminary CO2 and CH4 outputs
  - will be included in RAF netCDF files submitted to field archive.
- Quick look processed data will also be submitted to field archive, typically the day after each flight (separate ICARTT files)
- Differences between real time and quick look data:
  - Calibration adjustments to link all 3 species to NOAA GMD scale
    - » CO (typically ≤ 15% slope change)
    - » CO_2 (1 ppmv offset)
    - » H2O correction of CO_2 and CH_4 to report dry molar mixing ratios (in cases where cell WV > .01 %vol)
- Final data enhancements:
  - Synchronization: constant time offset applied to align with quick look data from other sensors; water vapor or ozone are typical references
  - Removal of calibration data and known intervals of poor data quality
- Final data will be archived separately from other RAF data, typically in ICARTT format


Power Spectral Density of 2311 CC2 and 2311 CH4 67500 to 6800C
Variance per Hz
Frequency (Hz)
2311 CO2
2311 CH4 67500 to 68000