TILDAS Dual Laser Trace Gas Analyzer

Sensitive, rapid, highly specific and continuous measurements of multiple atmospheric trace gases in ambient air



Applications

- Extremely sensitive detection of a wide variety of atmospheric trace gases, such as: methane, nitrous oxide, nitric oxide, nitrogen dioxide, carbon monoxide, carbon dioxide, formaldehyde, formic acid, ethylene, acetylene, carbonyl sulfide, acrolein, ammonia and others.
- Combustion monitoring and characterization.
- Isotopic monitoring of CH₄ and N₂O for source/sink characterization.
- Eddy covariance measurements.
- Fast response plume studies.
- · Air quality monitoring.
- Mobile measurements from ship, truck, and aircraft platforms.

Advantages

- Absolute trace gas concentrations without calibration gases.
- Fast time response.
- Free from interferences by other atmospheric gases or water vapor.
- Turnkey and unattended operation.
- Ready to be deployed in field measurements and on moving platforms.
- Two lasers allow simultaneous measurement of more species.
- Optical pathlength of either 76 meters or 210 meters.

TILDAS Dual Laser Trace Gas Analyzer

POPULAR INSTRUMENTS HIGHER PRECISION AND ACCURACY IS OBTAINABLE WITH MID-INFRARED LASERS

Clumped CO₂ Isotopes*



CH₄ lsotopes



CO₂, Water Isotopes



N₂O Isotopes







CH₄, N₂O, CO, CO₂, H₂O, C₂H₆



MECHANICAL SPECIFICATIONS FOR DUAL LASER TRACE GAS MONITOR

Dimensions:	560 mm x 770 mm x 640 mm (W x D x H)
Weight:	75 kg
Electrical Power:	250-500 W, 120/240 V, 50/60 Hz (without pump)

MULTIPASS CELL

Choice of 76 meter standard cell (V=0.5 liters) or 210 meter "Super Cell" (V=2 liters)

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REFERENCES

Nelson, D.D. et al., Characterization of a near-room-temperature, continuous-wave quantum cascade laser for long-term, unattended monitoring of nitric oxide in the atmosphere, Optics Let. 31, 2012-2014, 2006.

McManus, J.B. et al., Experimental assessment of N2O background fluxes in grassland systems, Applied Physics B, 85, 235-241, 2006.

McManus, J.B., M.S. Zahniser, D.D. Nelson, L.R. Williams, and C.E. Kolb, Infrared laser spectrometer with balanced absorption for measurements of isotopic ratios of carbon gases, Spectrochim. Acta A, 58, 2465-2479, 2002.

McManus, J.B., D.D. Nelson, J.H. Shorter, R. Jiménez, S. Herndon, S. Saleska, and M.S. Zahniser, A high precision pulsed QCL spectrometer for measurements of stable isotopes of carbon dioxide, J. Modern Optics, 52, 2309-2321, 2005.

Saleska, SR; J. Shorter, S. Herndon, R. Jimenéz, B. McManus, D. Nelson, M. Zahniser, What are the instrumentation requirements for measuring the isotopic composition of net ecosystem exchange of CO2 using eddy covariance methods? Isotopes in Environmental and Health Studies, 42 (1), 117, 2006.

Nelson, D.D., J. B. McManus, S. C. Herndon, M. S. Zahniser, B. Tuzson and L. Emmenegger, New Method for Isotopic Ratio Measurements of Atmospheric Carbon Dioxide Using a 4.3 µm Pulsed Quantum Cascade Laser, Appl. Phys. B, 90, 301–309, 2008.

Tuzson, B , J. Mohn, M. J. Zeeman, R. A. Werner, W. Eugster, M. S. Zahniser, D. D. Nelson, J. B. McManus, L. Emmenegger, High precision and continuous field measurements of δ 13C and δ 18O in carbon dioxide with a cryogen-free QCLAS, Appl. Phys. B, 92, 451-458, 2008.



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