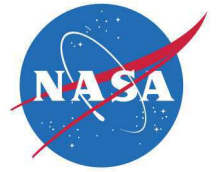




National Aeronautics and
Space Administration



Environment

Miniaturized Laser Heterodyne Radiometer

*A novel and compact system for measuring
greenhouse gases in the environment*

NASA Goddard Space Flight Center has developed a passive monitor for measuring greenhouse gases in the atmosphere including carbon dioxide, methane and carbon monoxide. Further, trace gas concentrations can be correlated with altitude, providing further delineation of composition. This is an autonomous instrument with a uniquely small footprint and is about the size of carry-on luggage.

BENEFITS

- Small size (carry-on luggage sized)
- Can correlate trace concentrations with altitude

technology solution



THE TECHNOLOGY

This instrument uses a variation of laser heterodyne radiometer (LHR) to measure the concentration of trace gases in the atmosphere by measuring their absorption of sunlight in the infrared. Each absorption signal is mixed with laser light (the local oscillator) at a near-by frequency in a fast photoreceiver. The resulting beat signal is sensitive to changes in absorption, and located at an easier-to-process RF frequency. By separating the signal into a RF filter bank, trace gas concentrations can be found as a function of altitude.

APPLICATIONS

The technology has several potential applications:

- ➔ Environmental Monitoring
- ➔ Meteorology
- ➔ Gas Line Monitoring for methane

PUBLICATIONS

Patent No: 8699029

National Aeronautics and Space Administration

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