**Dual Etalon Transceiver for Atmospheric Species Detection**  
Technology #14130

**Applications**

An application of this technology is in the field of spectroscopy.

**Problem Addressed**

The technical requirements for transmitters used in measuring the concentration of a target gas in the atmosphere over long ranges include high power, maximum sensitivity and high repetition rates. These requirements are quite difficult to meet practically. Therefore, there is a need for a gas detector that reduces or eliminates the transmitter technical requirements.

**Technology**

The dual etalon receiver (DUET) is a gas detector that relaxes some of the transmitter requirements by having a self-referencing receiver. The receiver is configured to receive light from a light source through gas, the light source having an optical bandwidth on the order of an absorption line width of the gas. The gas detector also includes two detectors and a processor. The first detector detects light transmitted through the first etalon and the second detector detects light reflected from the first etalon. The processor determines the quantity of gas based on the detected transmitted and reflected light.

**Advantages**

- High sensitivity for remote detection of gases over long ranges
- It is more accurate than conventional spectrometers

**Categories For This Invention:**

- Lincoln Laboratory
- Photonics
- Sensors (Photonics)
- Spectroscopy (Sensors)
- Life Sciences
- Instrumentation
- Spectroscopy (Instrumentation)

**Intellectual Property:**

Gas detector for atmospheric species detection  
Issued US Patent  
8,599,381
Inventors:
Alan DeCew
Eric Statz
Jonathan Ashcom

External Links:
Lincoln Laboratory
http://www.ll.mit.edu/

Image Gallery: