Geophysical Research Abstracts,
Vol. 11, EGU2009-12167, 2009
EGU General Assembly 2009

Incoherent broadband cavity enhanced absorption spectroscopy for in situ trace gas sensing using a Fourier transform approach

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A novel instrument for identifying trace gases from large polluting sources is being developed using visible to near infrared (VIS-NIR) broadband radiation in conjunction with cavity enhanced absorption spectroscopy (CEAS) and a Fourier transform spectrometer (FTS). The instrument consists of two units, a transmitter and a receiver, with one cavity mirror in each unit and several meters of open path between them. Combining CEAS with FTS will enable high selectivity in measurements due to the high spectral resolution of this approach in the near infrared (∼0.075 cm-1), where many "fingerprints" of trace gases are located. Initial experiments are being performed in the laboratory for characterising the light source, and for optimizing the optical components of the instrument. Instrument design, calibration and results from the preliminary experiments will be presented. The experimental advantages and limitations of this novel approach will be discussed.