A MOBILE ROBUST FTIR FOR PASSIVE FIELD DETERMINATION OF GASEOUS SPECIES

R. DAUM, A. BEIL, *Bruker Saxonia Analytik, Permoserstraße 15 Leipzig, D-04318 Germany*;
T. J. JOHNSON, B. M. ABRAHAM, *Bruker Optics, 19 Fortune Drive, Billerica, MA 01821*.

Passive remote sensing using an FTIR spectrometer allows the detection and identification of pollutant/toxic gases in the atmosphere. In this paper we report a measurement method and data reduction technique that to not require a previously measured reference spectrum. Recent experimental results obtained using a new high-sensitivity mobile FTIR are presented.
After a radiometric calibration of the spectrometer using reference blackbodies, the spectral radiance of the background is determined. Using the inverse function of Planck's radiation law, the brightness temperature $\epsilon(\nu)$ is computed. The temperature spectrum provides a spectrally constant reference for many of the materials used as backdrops in field measurements since their emittance is high and nearly constant in the 800 to 1200 cm^{-1} range. Experimental results are presented to illustrate the enhancement of the signal-to-noise ratio that can be achieved by using a backdrop that provides maximal temperature difference to ambient environment.