ANALYSIS OF ATMOSPHERIC TRACE GASES BY CORRELATING SOLAR SOURCED AND LONG OPEN PATH FT-IR SPECTRA

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Knoxville and the nearby Smoky Mountains presently experience an unhealthy air-quality for both plant life and humans. Air pollution in East Tennessee has been emphasized by recent presentations and visits by notable politicians. In order to better understand the sources and quantities of these air pollutants, the University of Tennessee Knoxville (UTK) has developed new techniques for the acquisition and analysis of solar absorption data and the implementation of open path IR techniques. Solar sourced atmospheric absorption data are recorded using a suntracker integrated to a Bomem DA8 FTIR. Pollutants in the local environs are studied with a 190 to 525.5m open path system located on the roof of the Science and Engineering Research Facility at UTK. Vertical concentration profiles are calculated using the solar absorption data with SFIT2. The *a priori* concentration profiles of SFIT2 can be adjusted with the open path data to produce the optimum concentration profile. A method for constructing long focal length mirrors (f˜100m) will be discussed. Several atmospheric trace gases (O3, N2O, CO, etc.)will be discussed in order to illustrate these techniques.