High Sensitivity Detection of Trichloroethylene Using Frequency-Modulated Tunable Diode Lasers

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There is strong interest in the remote sensing community for high sensitivity optical sensors capable of distinguishing between various volatile organic compounds. In an effort to meet this need we have applied frequency-modulation technique absorption spectroscopy using tunable lead salt diode lasers to detect the compound trichloroethylene. Detection was accomplished using the relatively strong band at 1250cm^{-1}. While detection of a low pressure vapor was relatively straightforward, line blending in atmospheric pressure broadened samples causes much reduced sensitivity. We discuss possible approaches to solving this problem as well some specific details of our frequency modulation techniques which help to optimize achievable sensitivity.