INTENSITY STUDIES OF OZONE IN THE 10 MICRON REGION BY SIMULTANEOUS SUB-MM/LASER-BASED INFRARED DIRECT ABSORPTION MEASUREMENTS

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Ozone is a common retrieval target from a variety of remote sensing platforms owing to both its importance in tropospheric and stratospheric chemical processes and readily accessible observation grade absorption/emission bands in the THz, infrared, visible, and ultraviolet. Refinement of the ν_3 band line intensities in the 10 micron region has been the target of many spectroscopic studies in the past decades with uncertainty claims now approaching the 1% level. These studies typically constrain experimental ozone number density using UV cross section measurements while simultaneously performing Fourier transform or laser-based measurements in the infrared. This talk will summarize ongoing efforts to perform dual band measurements using a mode-hop-free quantum cascade laser in the infrared that instead derives ozone partial pressures from simultaneously collected direct absorption spectra in the sub-millimeter (500-600 GHz) region. This alternative approach, which serves as the first sub-millimeter/laser-based infrared attempt to determine ozone intensities, is unique in that infrared intensities are ultimately anchored to dipole measurements accurate to the 0.1% level. A brief overview of previous ozone studies will be provided along with a detailed description of the experiment configuration and preliminary results.