

DEVELOPMENT OF A QUANTUM CASCADE LASER-BASED SPECTROMETER FOR MEASUREMENTS OF BIOGENIC VOLATILE ORGANIC COMPOUNDS

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Biogenic volatile organic compounds (BVOCs) are emitted into Earth's atmosphere by plants and are among the most abundant reactive organic species in the troposphere. These compounds play an important role in atmospheric chemistry, including the formation of secondary organic aerosols and production of surface-level ozone, a pollutant which can have negative health effects. BVOCs are generally measured and monitored using mass spectrometry and gas chromatography, but infrared spectroscopy is an excellent complementary tool for measuring these species. The development of quantum cascade lasers (QCLs) has provided robust, coherent light sources which give access to fundamental infrared transitions of BVOCs that lie in the "infrared window" from 8-14 μm . At Connecticut College, we are developing a QCL-based spectrometer for measuring BVOCs with high resolution and high sensitivity. We will present details on the construction of our spectrometer and preliminary data for measurements of isoprene (C_5H_8), the most abundant BVOC in the troposphere.