TERAHERTZ TIME DOMAIN SPECTROSCOPY OF COMPLEX ORGANIC MOLECULES IN ASTROPHYSICALLY RELEVANT ICES

BRETT A. McGUIRE, *Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA 91125*; SERGIO IOPPOLO, *Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA 91125*; MARCO A. ALLODI, MATTHEW J. KELLEY, *Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA 91125*; GEOFFREY A. BLAKE, *Division of Chemistry and Chemical Engineering and Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA 91125*.

We have constructed a new system to study the spectra of astrophysically-relevant ice analogs using THz time-domain spectroscopy from 300 GHz - 7 THz. Here, we present our initial efforts to explore the spectra of pure ices of simple, abundant interstellar species as well as complex organic molecules (COMs) and COM-doped ice mixtures. We will present preliminary spectra of pure H_2O, CO_2, methanol (CH_3OH), and methyl formate (CH_3COOH) ices, as well as spectra of these molecules embedded in a variety of other relevant interstellar analogs. Our results are discussed in the context of astronomical observations and the possibility of probing ice compositions in the absence of a background radiation source.