A NEW FAR-IR (THz) AND IR SPECTROMETER FOR THE STUDY OF ASTROCHEMICAL ICES

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

Far-IR (THz) spectroscopy provides a powerful technique capable of identifying solid phase molecules in the interstellar medium (ISM). Thus, laboratory data of ices in the THz region of the electromagnetic spectrum have the potential to support astronomical observations in the identification of complex organic molecules in the solid phase. In addition to providing a spectral fingerprint, THz spectroscopy probes the phonon modes of a solid. As such, the absorptions of ices in the THz region give insights into the structural dynamics of species in the solid phase.

This work will describe a new instrument capable of investigating ices in both the THz and Mid-IR. THz light is generated via plasma filamentation and detected via electro-optic sampling. The ability to collect spectra of ices in the Mid-IR using a commercial FTIR spectrometer allows us to compare the ices we create in the lab to the existing body of literature while building up a database of THz spectra of ices to aid in astronomical observations.