

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

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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 H₂O, CO₂, methanol (CH₃OH), and methyl formate (CH₃COOH) 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.