DEVELOPMENT OF A NEW CAVITY RINGDOWN SPECTROSCOPY SYSTEM FOR ASTROCHEMICAL STUDIES

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Cavity ringdown spectroscopy (CRDS) is a valuable tool for observing the rovibrational spectra of extremely dilute molecules. By adopting laboratory techniques like CRDS and quantifying the near-IR spectra of molecules of interstellar interest, we can increase our understanding of the properties and reactions of molecules in space. I present the design and construction of a new continuous-wave CRDS system at the University of Maryland for astrochemical studies. Further, I present the rotationally resolved vibrational spectrum of the first overtone of the C-H stretch in HCN measured with this system in the near-IR (1.5 μm). In future studies, this CRDS system will be used in tandem with a cryogenic buffer-gas cell to perform low-temperature experiments.