

MID-IR CAVITY RINGDOWN SPECTROSCOPY FOR ATMOSPHERIC ETHANE ABUNDANCE MEASUREMENTS

LINHAN SHEN, THINH QUOC BUI, *Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, USA*; LANCE CHRISTENSEN, *Science Division, Jet Propulsion Laboratory/Caltech, Pasadena, CA, USA*; MITCHIO OKUMURA, *Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, USA*.

We demonstrate a mid-IR ($3.3\ \mu\text{m}$) cw cavity ringdown spectrometer capable of measuring atmospheric ethane abundances. This technique can measure atmospheric ethane concentration as low as 100 ppb. The atmospheric ethane to methane ratio could also be observed by measuring methane concentration using a high precision near-IR ($1.65\ \mu\text{m}$) cavity ringdown spectrometer. We will also discuss the daily variation of ethane abundance and ethane to methane ratio in Pasadena observed using this technique.