

MID-IR CAVITY RINGDOWN SPECTROSCOPY MEASUREMENTS OF ATMOSPHERIC ETHANE TO METHANE RATIO

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In this work, we demonstrated a mid-IR ($3.3\ \mu\text{m}$) cw cavity ringdown spectrometer capable of measuring atmospheric ethane abundance and ethane to methane ratio. This technique can measure atmospheric ethane concentration as low as 70 ppb. Since ethane is a tracer for thermogenic methane emissions, this technique could be used to identify sources of atmospheric methane. We have demonstrated the capability of this instrument by measuring the atmospheric ethane composition and ethane to methane ratio in ambient air in Pasadena, California.