

Abstract Submitted
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Developments in Cavity-Enhanced Direct Frequency Comb Spectroscopy (CE-DFCS) BRYCE BJORK, ALEKSANDRA FOLTYNOWICZ-MATYBA, ADAM FLEISHER, PIOTR MASLOWSKI, JILA, University of Colorado, JUN YE, JILA, National Institute of Standards and Technology and University of Colorado — We achieve a quantum-noise-limited absorption sensitivity of $1.7 \times 10^{-12} \text{ cm}^{-1}$ per spectral element at 400 s of acquisition time using the cavity-enhanced direct frequency comb spectroscopy (CE-DFCS) technique in the mid-infrared. A frequency comb is locked to a high-finesse optical cavity and spectra are recorded using a fast-scanning Fourier transform spectrometer with an ultralow-noise autobalancing detector. In this talk, we will discuss our recent technical achievements and detailed understandings of the cavity-enhanced technique and mid-infrared detection methods. In addition, we will present trace gas detection as an application of the technique.

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