CAVITY-ENHANCED, FREQUENCY-AGILE RAPID SCANNING (FARS) SPECTROSCOPY: EXPERIMENTAL REALIZATIONS AND MEASUREMENT RESULTS

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We present a series of experimental realizations of cavity-enhanced, frequency-agile rapid scanning (FARS) spectroscopy using distributed feedback diode lasers, external cavity diode lasers, and ultra-narrow linewidth fiber lasers. FARS offers a scanning rate which is limited only by the cavity response time itself as well as a microwave-level frequency axis. Finally, it allows for an absorption sensitivity which is one of the highest ever reported. These realizations offer a range of applications from low-cost field measurements of trace gases to laboratory-based metrology.