DUAL ETALON FREQUENCY COMB (DEFCOM) SPECTROSCOPY

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A new spectrometer based on an interferogram produced by the output of two separate confocal etalons is described and first experiments will be described. This spectrometer has the resolution of the Free Spectral Range (FSR) of the etalons on a single laser shot over the bandwidth of the light source that that is used to excite the etalons. With signal averaging and scanning of the etalon mirror the resolution can be that of the ”ring-down” time of the etalons. By placing the sample of interest within one of the etalons one obtains the sensitivity of cavity ring down spectroscopy while performing Cavity Ring Down (CRD) spectroscopy over the entire bandwidth of the laser source used to excite the etalon. First data on measurements of overtone absorptions of water and weak electronic gamma-band absorption of oxygen will be presented. *Work supported by DOE Basic Energy Sciences.*