OFC-assisted PDH-locked FS-CRDS line-shape measurements of oxygen B-band transitions

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We present high resolution and high sensitivity line-shape mesurements of self-broadened oxygen B-band transitions. Data were acquired under low pressure conditions using the Pound-Drever-Hall-locked frequency-stabilized cavity ring-down spectrometer (PDH-locked FS-CRDS) [1] connected to the optical frequency comb (OFC) [2]. The line-shape analysis of the investigated transitions was performed with several theoretical models. The observed line narrowing is equally well described as Dicke narrowing or the speed dependence of collisional broadening. The neglect of the line-narrowing effect leads to underestimation of the collisional broadening coefficients by about 20%. We report mesured line intensities and collisional broadening coefficients with relative uncertainties below 0.3%, and line positions with uncertainties below 200 kHz.

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