

## FREQUENCY MEASUREMENTS WITH kHz-ACCURACY OF $^{12}\text{CO}_2$ TRANSITIONS IN THE 2.0 $\mu\text{m}$ REGION

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Absolute frequencies of 106 ro-vibrational transitions belonging to the 20012-00001 and 20013-00001 bands of  $^{12}\text{CO}_2$  have been measured by saturation spectroscopy. Lamb dips were observed using a cavity ring-down spectrometer linked to an optical frequency comb referenced to a GPS-disciplined Rb oscillator. The feed-forward technique<sup>a</sup> was applied to transfer the coherence of very stable comb emission lines to the laser source of the spectrometer (an external cavity diode laser) via an electro-optic modulator. This setup allows achieving transition frequencies measurements with kHz-level accuracy. The transition frequencies of the two bands are reproduced with a ( $1\sigma$ )-rms of about 1 kHz using the standard expression of the ground and upper energy levels, the ground state constants being constrained to the values reported in Wu et al.<sup>b</sup> The 20012 and 20013 vibrational states appear thus to be highly isolated except for a local perturbation of the 20012 state leading to an energy shift of 15 kHz at  $J'=43$ . Finally, comparison to transition frequencies reported in the HITRAN2020 database and the literature will be presented and discussed.

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<sup>a</sup>Gotti et al., *J Chem Phys* 2018, 148, 054202

<sup>b</sup>Wu et al., *Phys Chem Chem Phys*, 2020, 22, 2841-2848