PRECISION MEASUREMENT OF CARBON DIOXIDE HOTBAND TRANSITION AT 4.3 MICRON USING A HOT CELL

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We report a mid-IR spectrometer based on a difference frequency generation (DFG). This tunable CW DFG source covers the spectral range from 2.6 μm to 4.7 μm with an output power of a few mW. The saturation spectrum of the $^{12}C^{16}O_2$ hot band 01^11 - 01^10 P(30) transition is greatly enhanced by using a 40 cm long hot cell. The saturated absorption S/N ratio of over 1000 at 1 Hz bandwidth is achieved. We investigate the linewidth analysis and absolute frequency measurement of this transition. This transition center frequency of 69,267,228.761(15) MHz and the transition linewidth of 3.040(36) MHz are accurately measured.