DOUBLE MODULATION TECHNIQUE IN PULSED JET EXPERIMENTS: MOLECULAR VAN DER WAALS COMPLEXES

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A double modulation technique was used to achieve higher sensitivity in absorption measurements with a pulsed supersonic jet. The wavelength of a lead–salt diode laser was modulated at a frequency of 10 kHz and detected at twice the frequency by a lock–in amplifier, reducing significantly the influence of the low frequency excess laser noise. The output of this lock–in amplifier was measured by a boxcar integrator, driven at 80 Hz, the frequency of the pulsed jet. The same technique was applied to the jet absorption measurements in the millimeter wave region using mm–wave synthesizers as radiation sources. The recorded spectra of Ar-CH_4, Kr-CH_4 and Ar-CO molecular van der Waals complexes are presented in order to show the improved sensitivity of the tunable diode laser and mm-wave spectrometers.