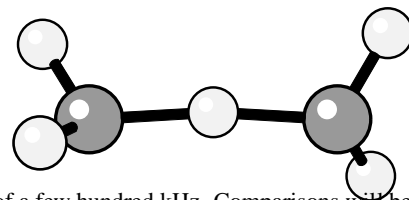


HYPERFINE-RESOLVED SATURATION SPECTROSCOPY OF METASTABLE N₂ IN THE (1-0) BAND OF THE $\tilde{B}^3\Pi_g - \tilde{A}^3\Sigma_u^+$ ELECTRONIC TRANSITION

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A spectrometer for measuring sub-Doppler saturation spectra in a discharge flow cell has been built and tested on the (1-0) band of the $\tilde{B}^3\Pi_g - \tilde{A}^3\Sigma_u^+$ electronic transition of ¹⁴N₂ near 11250 cm⁻¹. A cw Ti:sapphire laser is stabilized relative to a single frequency HeNe laser and offset scanned with a RF synthesizer. An amplitude-modulated bleach beam is counter-propagated with a phase-modulated probe beam through the discharge cell. Absorption and dispersion phase signals are demodulated in a probe beam receiver, then demodulated at the lower bleach modulation frequency and finally averaged with lock-in detection at the audio frequency of the AC-discharge. Isolated hyperfine lines are observed with a FWHM of about 7 MHz and the splittings can be recorded with a precision of a few hundred kHz. Comparisons will be made with more extensive prior work by Giesen et al.^{ab}



^aH. Geisen, D. Neuschäfer and Ch. Ottinger, Z. Phys. D. 4 (1987) 263-290

^bH. Geisen, D. Neuschäfer and Ch. Ottinger, Z. Phys. D. 17 (1990) 137-144