CONTINUOUS-WAVE CAVITY RINGDOWN STUDY OF THE FIRST POSITIVE BAND SYSTEM OF $N_2^*$

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We previously reported the assignment of the $N_2^+$ $A^2\Pi_u$ - $X^2\Sigma_g^+$ 2-1 vibronic band from continuous-wave cavity ringdown spectroscopy (cw-CRDS) of an $N_2$ plasma.[b] More than 400 lines from the $N_2^*$ $B^3\Pi_g$-$A^3\Sigma_u^+$ system were also observed during this experiment. While assignments for 37 vibronic bands from the first positive band system of $N_2^*$ have been reported in the literature, no assignments have been made within the frequency range of our laser. In this experiment, $N_2^*$ was formed in a positive column discharge of a mixture of $N_2$ and argon, and spectra were collected between 937 and 984 nm. We have now identified lines from the 3-3 band of $N_2^*$, and this spectral range is also expected to contain lines from the 2-2, 4-4, 7-8, and 8-9 bands. We will report on the progress of $N_2^*$ line assignment and the molecular constants determined from this work.

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[b]Widicus Weaver et al., *J. Mol. Spec*, **2008**, in press.