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#### OBSERVATION AND ANALYSIS OF ION-PAIR TRANSITIONS OF I<sub>2</sub> COOLED IN A SUPERSONIC FREE-JET EXPANSION

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The A<sub>N</sub>state of I<sub>2</sub> was observed for the first time in a free-jet expansion, where it was prepared by ArF laser excitation of I<sub>2</sub>/Ar mixtures close to the nozzle<sup>a</sup>. Twenty-seven bands in the v<sub>0</sub> = 0 progression of the DN- A<sub>N</sub>transition were studied by laser excitation spectroscopy, leading to the following improved constants (cm<sup>-1</sup>) for the A<sub>N</sub>and DNstates:

$$B_0 = 0.028054, B_e = 0.020526, \omega_e = 5.3 \times 10^{-5}, \\ T_e = 103.953, T_{ex} = 0.2097, T_{ey} = 2.687 \times 10^{-4}.$$

Many bands of the S- A transition have also been observed. These originate from A, v<sub>0</sub> = 0, and terminate on levels with 25#v<sub>N</sub>68 of the Sstate. Full analyses of both band systems will be presented.

<sup>a</sup>J. Tellinghuisen, S. Fei, X. Zheng, and M.C. Heaven, Chem. Phys. Lett. 176, 373 (1991).

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