## Abstract Submitted for the DAMOP06 Meeting of The American Physical Society

 $N_2^+$  fluorescence in photoionization of  $N_2$  by 16.3-150 eV photons J.R. MACHACEK, T.J. GAY, University of Nebraska, J.E. FURST, University of Newcastle-Ourimbah, A.L.D. KILCOYNE, J.D. BOZEK, ALS/LBNL, H. GOULD, LBNL, M.S. LUBELL, CC-CUNY, K.W. MCLAUGHLIN, Loras College — We have studied the intensity of fluorescence from the  $B^2\Sigma_u^+ - X^2\Sigma_g^+$  ( $\nu'=1,\nu''=4$ ) transition (514.9 nm) in  $N_2^+$  as a function of incident photon energy following the photoionization of  $N_2$  by linearly polarized light with energy between 16.3 and 150 eV. This experiment was conducted at beamline 10.0.1.2 of the ALS. To our knowledge, this measurement represents the first unambiguous observation of a specific molecular transition in such collisions. A broad maximum peaked at ~23 eV is observed in the production cross section for this specific vibrational state. Non-state specific measurements were taken from 115 to 200 nm which includes multiple  $N^+$  ionic fluorescence lines as previously measured from 19.7 to 37.6 eV by Erman et al. [1]. Our current measurements extend this observation from 16.3 to 150.0 eV. [1] P. Erman et al., J. Phys. B 26 (1993) 4483.

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