Abstract Submitted
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Ionization and Dissociation of N_2 from 17.5 to 36.5 eV by Linearly and Circularly Polarized Light J.E. FURST, University of Newcastle-Ourimbah, T.J. GAY, University of Nebraska-Lincoln, H. GOULD, A.L.D. KILCOYNE, LBNL, J.R. MACHACEK, University of Nebraska-Lincoln, K.W. MCLAUGHLIN, Loras College — We have measured the linear (P_1) and circular (P_3) polarization of the fluorescence emitted in the $B^2\Sigma_u^+ \rightarrow X^2\Sigma_g^+$ ($\nu' = 0, \nu'' = 0$) transition (391.4 nm) of N_2^+ after photoionization of N_2 by both linearly and circularly polarized VUV radiation. The value of P_1 for linearly polarized excitation is in qualitative agreement with previous results [1]. Results for circularly-polarized excitation show significantly different energy dependence. In this energy range, photofragmentation into neutral atoms caused by the predissociation of doubly-excited Rydberg states via non-Rydberg doubly-excited resonances competes with photoionization [2]. We have measured the intensity and a distinct non-zero P_3 of the fluorescence from the $NI\ 3p\,^4P^o \rightarrow 3s\,^4P$ transition (818 nm) between 22.5 and 25 eV which corresponds to the initial excitation of the N_2 Rydberg R(C) states. [1] J. A. Guest *et al.*, Phys. Rev. A **28**, 2217 (1983) [2] P. Erman *et al.*, Phys. Rev. A **60**, 426 (1999) Support provided by the NSF (Grant PHY-0354946), the DOE (LBNL/ALS) and the ANSTO (Access to Major Research Facilities Programme).

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