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Photoelectron Angular Distributions of Rotationally Resolved Autoionizing States of Molecular Nitrogen[1] ALEXANDER M. CHARTRAND, Bryn Mawr College, UGO JACOVELLA, ETH Zrich, DAVID M. P. HOLLAND, STFC Daresbury Laboratory, BERENGER GANS, CNRS, Univ. Paris-Sud, and Universit Paris-Saclay, STEPHEN T. PRATT, Argonne National Laboratory, LAURENT NAHON, GUSTAVO A. GARCIA, Synchrotron Soleil, XIAOFENG TANG, Chinese Academy of Sciences, ELIZABETH F. MCCORMACK, Bryn Mawr College — Rotationally resolved excitation of N_2 just above the ionization threshold allowed the recording of photoelectron angular distributions (PADs) for selected autoionizing levels of the $(X^+\,^2\Sigma_g^+)\ 6p\sigma$, $v = 2$ and $(X^+\,^2\Sigma_g^+)\ 9f$, $v = 1$ Rydberg states. Because the direct ionization continuum is weak compared to the autoionizing resonances, the PADs can be predicted using simplified formulae based on the work of Raoult *et al.* [*J. Chim. Phys.* **77**, 599 (1980)]. The observed PADs are generally in good agreement with these predictions. Photoelectron angular distributions were also recorded for individual rotational levels of the $b'\,^1\Sigma_u^+$, $v = 42$ and 43 states, and for two complex resonances arising from the interactions between the b' state and Rydberg states converging to the X^+, A^+, and B^+ states of the ion. The analysis of these PADs is more complex and is still underway.

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Alexander Chartrand
Bryn Mawr College

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