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Dipole and nondipole photoelectron angular distributions of molecular hydrogen[1] S.H. SOUTHWORTH, E.P. KANTER, B. KRAESSIG, Argonne National Laboratory, R. WEHLITZ, U. Wisconsin, B. ZIMMERMANN, Louisiana State U., V. MCKOY, California Institute of Technology — Molecular hydrogen has long been a prototype system for experimental and theoretical studies of photoionization. Measurements of angle-integrated cross sections and the anisotropy parameter β provide experimental tests of molecular photoionization theory and calculational approaches within the dipole approximation. Nondipole interactions distort dipole angular-distribution patterns and can be probed by measurements of forward-backward asymmetries with respect to the photon propagation vector. Nondipole asymmetries can be calculated to first order in theoretical treatments that include cross terms between electric-dipole and electric-quadrupole or magnetic-dipole photoionization amplitudes. In this work we report measurements of the dipole anisotropy parameters β and the nondipole asymmetries $\gamma+3\delta$ of H_2 over the 20–150 eV photon-energy range. Comparison is made with calculations based on first-order corrections to the dipole approximation with amplitudes calculated within the single-channel, static-exchange approximation.

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