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Kinetic Energy Release Effects on the Angular Distributions from the Photoionization of H_2^+ JAMES COLGAN, Los Alamos National Laboratory, ALAIN HUETZ, CNRS-Université Paris Sud, TIM REDDISH, University of Windsor, MICHAEL PINDZOLA, Auburn University — Recent experimental and theoretical work examining the double photoionization of H_2 has uncovered surprising changes in the resulting differential cross sections as the kinetic energy released to the outgoing protons is varied. In this work, a complementary study is made of the angular distributions arising from the photoionization of H_2^+ at various internuclear separations R. Different internuclear separations correspond to different amounts of kinetic energy released to the exploding protons. We find that the angular distributions for the $\sigma \rightarrow \pi$ transition in H_2^+ are relatively insensitive to changes in R, but that the angular distributions for the $\sigma \rightarrow \sigma$ transition display dramatic variations with R. The reasons for this effect and the connections with early work on H_2^+ photoionization will be discussed.

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