

Abstract Submitted
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Strong field studies of F_2^- dissociation and photodetachment* BEN BERRY, BETHANY JOCHIM, T. SEVERT, PEYMAN FEIZOLLAH, KANAKA RAJU P., K. D. CARNES, B. D. ESRY, I. BEN-ITZHAK, J. R. Macdonald Laboratory, Physics Department, Kansas State University, Manhattan, KS 66506 — While molecular anions have long been used as tools to investigate molecular dynamics, very few studies focus on their behavior in a strong field. In this work, we explore the strong field dissociation and photodetachment of F_2^- under a variety of laser conditions. The use of a keV beam of F_2^- allows us to measure all of the molecular fragments except electrons, and we obtain the full 3D momentum of breakup using a coincidence 3D momentum imaging technique. Past measurements of photoelectrons from F_2^- resulted in some uncertainty about the photoemission mechanisms due to unknown nuclear dynamics¹. Our measurements of the final nuclear products (both F_2 and $F + F$) help clarify the underlying physics associated with this previous study. In addition, we identify dissociation pathways and use the measured kinetic energy release (KER) to evaluate the initial rovibrational population of the anion.

¹ Hannes Hultgren and Igor Yu. Kiyan, Phys. Rev. A **84**, 015401 (2011).

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