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Determining the branching ratios of site-specific water and hydronium formation from ethanol[1] T. SEVERT, K. BORNE, F. ZIAEE, B. JOCHIM, J.R. Macdonald Laboratory, Physics Department, Kansas State University, Manhattan, KS 66506, USA, P. FEIZOLLAH, J.R. Macdonald Laboratory, Physics Department, Kansas State University, Manhattan, KS 66506, B. KADERIYA, P. KANAKA RAJU, K. D. CARNES, D. ROLLES, A. RUDENKO, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Physics Department, Kansas State University, Manhattan, KS 66506, USA, N. EKANAYAKE, M. NAIRAT, N. P. WEINGARTZ, B. M. FARRIS, B. G. LEVINE, J. E. JACKSON, M. DANTUS, Department of Chemistry, Michigan State University, East Lansing, MI 48824, USA
— In ethanol, water and hydronium cations may be formed by single or double hydrogen migration, respectively. Due to the geometric structure of ethanol, the migrating hydrogens can originate from either the CH_3 or CH_2 sites to form bonds with the OH moiety. To determine the site-specific branching ratios of water and hydronium formation induced by an ultrafast intense laser field, we employ coincidence momentum imaging to measure the fragmentation of a variety of isotopologues of ethanol. We also briefly highlight how this method can be used to determine the site-specific branching ratios of H_2^+ and H_3^+ formation.

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Travis Severt
J.R. Macdonald Laboratory, Kansas State University

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