Abstract Submitted
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Towards quantum-state-resolved ultracold chemical reactions of KRb molecules[1] MING-GUANG HU, Harvard-MIT Center for Ultracold Atoms (CUA), Department of Chemistry and Chemical Biology, Harvard University, YU LIU, ANDREI GHEORGHE, Harvard-MIT Center for Ultracold Atoms (CUA), Department of Physics, Harvard University, YEN-WEI LIN, DAVID GRIMES, KANG-KUEN NI, Harvard-MIT Center for Ultracold Atoms (CUA), Department of Chemistry and Chemical Biology, Harvard University — Ultracold atoms and molecules provide a new platform to explore chemical reactions at ultralow temperatures. In this regime, reactions that are unlikely to happen classically could proceed surprisingly efficiently due to their quantum mechanical nature. We are investigating a likely 4-center reaction, 2KRb->K2+Rb2+KE(1.24 meV), in the temperature regime below 1 micro-Kelvin. Towards this goal, we have built an apparatus that combines AMO techniques for ultracold reagent preparation and physical chemistry techniques for reaction product detection through resonance enhanced multiphoton ionization (REMPI) and velocity-map imaging (VMI). The micro-eV sensitivity of our VMI also provides a new tool to study ultracold Rydberg chemical reactions and few-body collisions.

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