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Quantum Reactive Scattering of Ultracold K+KRb Reaction: Universality and Chaotic Dynamics[1] J. F. E. CROFT, University of Nevada, Las Vegas, NV 89154, C. MAKRIDES, JQI and NIST, Giathersburg, MD, M. LI, A. PETROV, Temple University, Philadelphia, PA 19122, B. K. KENDRICK, Los Alamos National Laboratory, Los Alamos, NM 87545, N. BALAKRISHNAN, University of Nevada, Las Vegas, NV 89154, S. KOTOCHIGOVA, Temple University, Philadelphia, PA 19122 — A fundamental question in the study of chemical reactions is how reactions proceed at a collision energy close to absolute zero. This question is no longer hypothetical: quantum degenerate gases of atoms and molecules can now be created at temperatures lower than a few tens of nanoKelvin. In this talk, we discuss the benchmark ultracold reaction between, the most-celebrated ultracold molecule, KRb and K. We report numerically exact quantum-mechanical calculations of the K+KRb reaction on an accurate ab initio ground state potential energy surface of the K_2Rb system and compare our results with available experimental data and predictions of universal models. The role of non-additive three-body contributions to the interaction potential is examined and is found to be small for the total reaction rates. However, the rotationally resolved rate coefficients are shown to be sensitive to the short-range interaction potential and follow a Poissonian distribution.

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