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Quantum Dynamics through Conical Intersections in Heteronuclear Alkali-Metal Trimers[1] ALEXANDER PETROV, CONSTANTINOS MAKRIDES, SVETLANA KOTOCHIGOVA, Temple University — Multi-particle potential surfaces have a number of characteristics that are absent from the more familiar two-body potentials of their constituents. Specifically in the case of triatomic alkali systems, the lowest two doublet surfaces are degenerate at specific locations commonly known as conical intersections. The collection of these points of intersection form a seam that trace out a line in nuclear space. As the complex propagates along the reaction path, the degeneracy at the seam allows for a radiationless transition between the surfaces. Here we analyze the lower two doublet states of the KRbK trimer. First, we map out the seam of intersections throughout the nuclear space and determine branching vectors that provide an accurate description of spatial derivative couplings in the vicinity of conical intersections and characterize the subsequent dynamics in the immediate region. We also revisit classical simulations of the nuclear motion on multiple surfaces and investigate how chaotic motion on the complex surfaces affect the reaction in the ultracold domain.

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