

Coherent Control of Ultracold KRb Molecules

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Our knowledge of the KRb molecule and its spectroscopy has greatly increased in recent years. We have extensively studied the long-range molecular states correlated to the $K(4s) + Rb(5p_{1/2,3/2})$ asymptotes by ultracold photoassociation (PA)[1,2]. We have also studied molecules in many vibrational levels produced by PA within about 30 cm^{-1} of the $K(4s) + Rb(5s)$ ground asymptote using resonance-enhanced multiphoton ionization[3], which also provides detailed spectroscopy of the previously unobserved $4^1\Sigma^+$ states[4]. Finally, we have observed some of these same levels with rotational resolution using ion depletion spectroscopy[5]. It is clear there is now considerable opportunity for coherent control experiments because of the extensively studied nonadiabatic interactions in KRb.

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