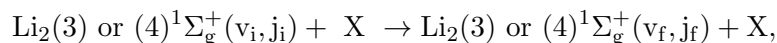


Abstract Submitted  
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**Molecular Energy Transfer in Highly Excited Electronic States**

JACOB FANTHORPE, BRIAN STEWART, Wesleyan University, Department of Physics — We present an experimental study of the energy-transfer dynamics of inert gases with lithium dimer in highly excited electronic states:



with the lithium molecule prepared via two-photon excitation in a single rovibrational level in the E  $(3)^1\Sigma_g^+$  or F  $(4)^1\Sigma_g^+$  excited electronic states. The E state resembles the previously studied A  $(1)^1\Sigma_u^+$  state in having nearly the same  $r_e$  and  $\omega_e$  values, indicating that differences in the rate constants are most likely due to difference in the spatial distributions of the electrons. We find that, in both the E and F states, rotational energy transfer occurs at a similar overall rate as in the previously studied A state. However, the distribution of final levels is dramatically different from that in the A state, being much narrower. This implies a more nearly isotropic interaction in the highly excited states. The rotational distribution of vibrationally inelastic rate constants in the F state, on the other hand, resembles that in the A state.

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