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Strong field impulsive alignment in the presence of high temperatures and large centrifugal distortion DOUGLAS BROEGE, Stanford University, RYAN COFFEE, Stanford Linear Accelerator Center, PHILIP BUCKSBAUM, Stanford University, Stanford Linear Accelerator Center — We achieve impulsive alignment in a 400K sample of diatomic iodine. This alignment results in an ensemble of coherent rotational wavepackets with revival structures at 220 and 440 ps. The revivals contain many more oscillations than are typically seen in rotational wavepackets. We find that the high initial temperature, rather than the strength of the laser impulse, brings out the centrifugally distorted revival oscillations. We present polarization measurements of this rotational wavepacket, along with semi classical simulations showing the importance of the thermal distribution of population in both rotational and vibrational states. These simulations show that excitation of coherent rotations is possible even in a system where the thermal energy is large compared to the energy exchanged with the laser field.

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