Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Extracting the polarizability anisotropy from transient alignment of HBr[1] DANIEL PINKHAM, THIBAULT VOGT, ROBERT JONES, Physics Department, University of Virginia — The fundamental response of a molecule to an applied laser field is governed in part by its anisotropic polarizability, $\Delta\alpha$, a quantity for which experimentally verifiable values are not always available in the literature. We show that comparison of the efficiency of transient molecular alignment of one diatomic species with known $\Delta\alpha$, to that of other diatomic species with unknown $\Delta\alpha$, can be an effective technique for measuring the unknown anisotropies. Specifically, we utilize identical 30 fsec, 800 nm laser pulses to transiently align N_2 and HBr. Using the accepted value of $\Delta\alpha$ for N_2, and comparing the time-dependent revival structures for each molecule with the predictions of a rigid rotor simulation, we extract values for the rotational temperatures for each molecule and determine $\Delta\alpha$ for HBr.

[1]This work has been supported by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences, Chemical Sciences, Geosciences, and Biosciences Division.

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Date submitted: 01 Feb 2008 Electronic form version 1.4