Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Extracting irreversible dephasing rates from the echoes of Rydberg Stark wavepackets. JEFF MESTAYER, B. WYKER, F.B. DUNNING, Rice University, C. REINHOLD, Physics Division, Oak Ridge National Laboratory, S. YOSHIDA, J. BURGDÖRFER, Vienna University of Technology — The precession of an electric dipole moment in an external electric field can be reversed by a reversal of the field direction. This time reversal operation allows the study of reversible and irreversible dephasing of Rydberg wavepackets through measurements of the electric dipole echoes generated by the time reversal. The effects of different sources of dephasing are discussed in detail. Stochastic interactions with the environment are analyzed in a controlled manner using artificially synthesized "colored" noise. The rate of irreversible dephasing is obtained from the reduction in the size of echoes when multiple field reversals are applied. Research supported by the NSF, the Robert A. Welch Foundation, the OBES, U.S. DoE to ORNL, and by the FWF (Austria).

Jeff Mestayer
Rice University

Date submitted: 30 Jan 2008 Electronic form version 1.4