

Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

STIRAP in a sodium gas using picosecond lasers KEVIN LYON, SUSAN D. ALLEN, Arkansas State University, MICHAEL J. JOHNSON, Brigham Young University, WILLIAM D. MURRY, DANIEL R. BRITTON, TOMASZ KUTNER, J. BRUCE JOHNSON, Arkansas State University — We demonstrate for the first time with picosecond lasers, the STIRAP technique on sodium vapor with a ladder scheme using the $3p (^2P_{1/2}) \leftarrow 3s (^2S_{1/2})$ and $5s (^2S_{1/2}) \leftarrow 3p (^2P_{1/2})$ transitions. Light to couple the states was produced by two synchronously pumped OPGs and further amplified in two OPAs (pumped by the 355 nm light from a picosecond YAG). Fluorescence from the 5s state to both 3p states ($^2P_{1/2}$, $^2P_{3/2}$) and from both 3p states to the 3s state was measured with a monochromator using a gated CCD to eliminate Rayleigh scattered light. Our results indicate a five-fold increase in the transfer efficiency to the 5s state when the laser pulse that couples the 3p and 5s states temporally precedes the laser pulse tuned to the $3p \leftarrow 3s$ transition.

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Date submitted: 04 Feb 2008

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