Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Atomic coherence engineering using controllable phase-shifts: Towards a pulsed EIT-Raman lattice clock at JILA T. ZANON-WILLETTE, A.D. LUDLOW, S. BLATT, M.M. BOYD, T. ZELEVINSKY, G.K. CAMPBELL, E. ARIMONDO, J. YE, JILA, National Institute of Standards and Technology, and University of Colorado — While fermion-based optical lattice clocks have made rapid progress recently [1], it is also interesting to explore a different kind of ultra-stable optical clocks based on bosons addressed by EIT-Raman laser fields, which may lead to practical advantages. Following two recent challenging proposals [2,3], we present several possible interrogation schemes to probe the forbidden clock transition of ultracold bosonic ^{88}Sr atoms and to control the atomic phase accumulated during pulsed interactions while cancelling ac stark shifts. Used to finely tune temporal evolution of clock states selected as qubits, these phase shifts are relevant to a new kind of high resolution experiments controlling the spin dynamics in a radiative non symmetrical Λ configuration. We will discuss the experimental apparatus and the stabilization scheme currently under construction in order to demonstrate the EIT-Raman spectroscopy in the Lamb-Dicke regime enabled by an optical lattice. [1] M. M. Boyd *et al*, Science 314, 1430 (2006). [2] R. Santra *et al*, Phys. Rev. Lett. 94, 173002 (2005). [3] T. Zanon-Willette *et al*, Phys. Rev. Lett 97, 233001 (2006).

Thomas Zanon-Willette
JILA, National Institute of Standards and Technology

Date submitted: 01 Feb 2007 Electronic form version 1.4