Abstract Submitted
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Composite pulse manipulation of atomic qubits[1] THOMAS HENAGE, MARIE DELANEY[2], ERICH URBAN, TODD JOHNSON, LARRY ISENHOWER, DENIZ YAVUZ, THAD WALKER, MARK SAFFMAN, University of Wisconsin Madison — We present recent progress on the use of composite pulse techniques for fast, high fidelity manipulation of neutral atom qubits in optical dipole traps. We electronically control the amplitude and phase of a 3.4 GHz microwave signal in under 200 ns. The time modulated microwave signal is applied to a laser diode which generates sidebands with controllable amplitude and phase that drive two-photon stimulated Raman transitions between Rb hyperfine states. The Raman fields allow qubit rotations at rates greater than 1 MHz. Using this system we demonstrate the use of composite pulses for manipulation of trapped atomic qubits.

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