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Robust Manipulation of Neutral Atom Qubits BRIAN MISCHUCK, WORAWARONG RAKREUNGDET, POUL JESSEN, University of Arizona —
Quantum information can be encoded in the hyperfine ground states of Cesium atoms trapped in optical lattices. Arbitrary manipulations of single atomic qubits on the Bloch sphere may be performed by driving the transition between those ground states with a resonant microwave field. We explore the use of composite pulses similar to those used in NMR in our atom/lattice system, and show experimentally that they are robust against errors in pulse timing, microwave power and detuning from resonance.

Brian Mischuck

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