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Optical Feshbach Resonances in ^{88}Sr TRAVIS NICHOLSON, SEBASTIAN BLATT, BENJAMIN BLOOM, JUN YE, JILA, University of Colorado —
Recent proposals have shown that quantum degenerate gases of alkaline earth atoms can be used for a number of novel quantum computing and quantum simulation experiments [1]. Strontium seems to be a good candidate for such experiments because of the precise control and high-resolution spectroscopy demonstrated by optical lattice clocks [2]. Unfortunately, the small scattering length of ^{88}Sr is not amenable to evaporative cooling techniques that are usually used to reach quantum degeneracy [3,4]. Furthermore, increasing the scattering length of alkaline earths with a magnetic Feshbach resonance is not possible due to their spinless electronic ground state configuration. However, recent theoretical and experimental work suggests the possibility of changing scattering lengths in alkaline earths with laser light [5]. Using this optical Feshbach resonance near strontium's narrow $^1S_0 \rightarrow {}^3P_1$ intercombination transition might allow its scattering length to be controlled without significant atom loss. We report our progress in demonstrating an optical Feshbach resonance in ^{88}Sr.
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