

Abstract Submitted  
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**Optical control of interaction strength in ultracold atomic gases with long lifetime**<sup>1</sup> LOGAN W. CLARK, YU-TING CHEN, LI-CHUNG HA, CHEN-YU XU, CHENG CHIN, Univ of Chicago — The great utility of cold atom systems as quantum simulators arises from the experimenter's ability to continuously tune their Hamiltonians. Recently, there has been a great deal of interest in achieving optical control of Feshbach resonances, which would allow spatial modulation of the interaction strength at short length scales as well as fast temporal modulation. We report on a new scheme for optically controlling interaction strength using the effective magnetic field from a circularly polarized laser near a magnetic Feshbach resonance. This approach is technologically simple and overcomes the major shortcomings of existing methods; it provides access to a wide range of scattering lengths while maintaining long quantum gas lifetimes of many hundreds of milliseconds and avoiding incidental conservative forces on the atoms. We will report progress on experimentally realizing this scheme.

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