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Control of photodetachment spectra through laser dressing[1]
NATHAN MORRISON, JILA and University of Colorado at Boulder, CHRIS H. GREENE, Purdue University — Photodetachment and photoionization spectra often display rich resonance structures. The properties of these spectra can be modified through dressing with intense laser fields, providing control over photon absorption and the emitted electron. We present a Floquet R-matrix method for calculating photodetachment cross sections in the presence of a dressing laser. The full wave functions in the Floquet formalism for bound and escaping electrons are found by solving the Schrödinger equation near the atomic core and applying analytic boundary conditions outside of the interaction region. These calculations are used to investigate the modification of existing resonances, such as modifying the shape, or q parameter, of Feshbach resonances. We also investigate the creation of new resonances in cases where high-lying bound states become autoionizing through the absorption of dressing laser photons.

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