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Microwave dressing of ultracold ^{23}Na^{40}K molecules ZOE YAN, YIQI NI, JEE WOO PARK, SEBASTIAN WILL, HUANQIAN LOH, Massachusetts Institute of Technology, KANG KUEN NI, Harvard University, MARTIN ZWIERLEIN, Massachusetts Institute of Technology — Ultracold molecules with tunable dipolar interactions are a promising platform for quantum simulation and the creation of novel states of matter. Previously, we have demonstrated the creation of a spin-polarized ensemble of fermionic ^{23}Na^{40}K molecules in their rovibronic and hyperfine ground state. One way to induce strong dipole moments is microwave dressing, which has been proposed to allow shielding of inelastic collisions and the realization of topological superfluids. By applying microwave fields near the frequency of the transition to the first rotationally excited state, we can induce an oscillatory dipole moment of up to 1.1 Debye in the molecules. We characterize this microwave dressing via the Autler-Townes splitting it induces in a rotational transition. We will present recent work exploring how microwave dressing affects the collision rate in the molecular gas.

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