

Abstract Submitted
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Ultracold Gas of Fermionic Molecules in the Triplet Ground State JULIANA PARK, TIMUR RVACHOV, Massachusetts Inst of Tech-MIT, HYUNGMOK SON, Harvard University, MARTIN ZWIERLEIN, ALAN JAMISON, WOLFGANG KETTERLE, Massachusetts Inst of Tech-MIT — The ability to produce and manipulate ultracold gases of molecules in well-defined internal states offers opportunities to study quantum chemistry, many-body physics, and quantum information processing. The NaLi molecule, the lightest bi-alkali molecule, in the triplet ground state is notable for its non-zero electric and magnetic dipole moments and long collisional lifetime due to its predicted small universal loss rate. This enables us to investigate the complexity of chemical reactions by finding links to scattering theory. Also, we can seek the possibility of quantum simulation in many-body physics aided by long-range interactions between the molecules. We have previously made the long-lived triplet ground state molecules through stimulated rapid adiabatic passage from Feshbach molecules and discovered the hyperfine structure. We report results of recent collisional studies with our triplet state molecules.

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