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Toward Creation of Triplet Ground State NaLi Molecules HYUNGMOK SON, Massachusetts Institute of Technology, Harvard University, TIMUR RVACHOV, ARIEL SOMMER, JULIANA PARK, Massachusetts Institute of Technology, SEPEHR EBADI, University of Toronto, MARTIN ZWIERLEIN, WOLFGANG KETTERLE, ALAN JAMISON, Massachusetts Institute of Technology — Ultracold heteronuclear molecules offer a unique platform for the study of many-body physics, quantum information processing, and controlled chemistry at the quantum level. For this purpose, diatomic molecules in absolute, singlet ground states have been created with various combinations of alkali atoms. The NaLi molecules is unique in that the triplet ground state is expected to have a long collisional lifetime, giving access to novel spin lattice Hamiltonians that harness with both the electric and magnetic moments. In addition, as the lightest bialkali dimer, the low density of states will provide us with the potential to study resolved Feshbach resonances between the molecules. We report our progress on the creation of a large sample of fermionic NaLi molecules in the triplet ground state through STIRAP from weakly-bound molecules, which may be produced through magneto-association or two-stage photo-association.

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