

Abstract Submitted
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Atom-molecule coherence in heteronuclear Li-Yb¹ ALAINA GREEN, JUN HUI SEE TOH, KHANG TON, SUBHADEEP GUPTA, University of Washington — We have demonstrated coherent coupling between Li+Yb free atom pairs and LiYb molecules in the electronic ground state via two-photon free-bound Raman processes. Coherent control is manifest in the creation of a dark atom-molecule superposition state. Evidence for this dark state is observed in a crossed optical dipole trap containing a mixture of ultracold ⁶Li and ¹⁷⁴Yb, as the suppression of photoassociative loss within a narrow (sub-natural) frequency range. We intend to utilize this dark state to perform Stimulated Raman Adiabatic Passage (StiRAP) to create ultracold samples of LiYb in the electronic ground state. The non-alkali LiYb molecule possesses both electric and magnetic dipole moments, and the unpaired electron degree of freedom could be utilized towards magnetic trapping of ultracold molecules as well as tuning of molecular collisions and reactions.

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