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Ultracold Mixture of Lithium and Metastable Ytterbium Atoms ALEXANDER KHRAMOV, ANDERS HANSEN, WILLIAM DOWD, RICHARD ROY, SUBHADEEP GUPTA, University of Washington — We are investigating the ultracold system comprised of ground-state lithium (⁶Li) and ytterbium in the metastable ³P₂ state (¹⁷⁴Yb*). Quantum mixtures of alkali and alkaline-earth-like atoms can offer new opportunities for the study of few- and many-body physics. In addition, they can be used to create polar paramagnetic molecules. Unlike mixtures where both species are in the ground state, mixtures with Yb in the metastable state are expected to exhibit wide magnetic Feshbach resonances. In our case, this would allow for the study of strongly-interacting mass-mismatched systems and creation of diatomic LiYb* molecules by magneto-association. Furthermore, a diatomic molecule formed from these constituents is predicted to have a large dipole moment of 4-7 Debye. We will report on the production of Yb in the ³P₂ state in a 1064 nm optical trap by optical pumping via the ³D₂ state. We will also report on ongoing experiments with co-trapped Li.

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