

Abstract Submitted
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Towards Photoassociation and Coherent Control of Cold LiRb Molecules¹ JOHN LORENZ, ADEEL ALTAF, SOURAV DUTTA, Department of Physics, Purdue University, DANIEL S. ELLIOTT, YONG P. CHEN, Department of Physics, School of Elec. and Comp. Eng., Purdue University — We present our progress in creating and coherently controlling cold LiRb molecules. We have set up a dual-species ${}^7\text{Li}/{}^{85}\text{Rb}$ magnet-optical trap. Studies of how densities of one atomic species are affected by the presence of another trapped atomic species allow us to probe ${}^7\text{Li}$ - ${}^{85}\text{Rb}$ collisional cross section. We seek to create cold LiRb molecules via photoassociation and detect production of LiRb using trap loss spectroscopy. Once LiRb molecules are created, we will explore controlling molecular alignment and orientation using optical coherent control. One possible method of control entails using quantum interference between multiphoton photoassociation processes to selectively create oriented molecules. Our technique may have possible applications in polar molecule based qubit operations taking advantage of the large dipole moment of LiRb.

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