

Abstract Submitted  
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**Autler-Townes splitting in a spin-orbit mixed singlet-triplet pair of rovibrational levels of the Lithium dimer molecule** JIANBING QI, Penn State University, MARJATTA LYYRA, Temple University, PENN STATE UNIVERSITY AND TEMPLE UNIVERSITY COLLABORATION — We demonstrate Autler-Townes splitting in a singlet-triplet pair of ro-vibrational levels perturbed by the spin orbit interaction in the Lithium dimer molecule using cw lasers. The two upper excited spin-orbit mixed singlet-triplet molecular rovibrational levels are coupled by a stronger cw coupling laser to an auxiliary lower rovibrational level, which results in Autler-Townes splitting or ac Stark shift of the coupled levels. The splitting depends on the strength and the detuning of the coupling laser. The excitation spectra and the splitting lineshape were obtained by detecting the fluorescence from the mixed pair following optical-optical double resonance excitation. The preliminary density matrix equation analysis of the experimental spectra is in good agreement with the experimental data. Supported by NSF PHY 0555608, the Lagerqvist Fund of Temple University, and Penn State Research and Development Grant.

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