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Feshbach Resonance Optimized Photoassociation Spectroscopy of Rb SEAN KRZYZEWSKI, THOMAS AKIN, JAMES DIZIKES, MICHAEL MORRISON, ERIC ABRAHAM, University of Oklahoma — We present preliminary results of an experiment to measure singly-excited molecular electronic potential curves of Rubidium using Feshbach optimized photoassociation. A Feshbach resonance is used to enhance the photoassociation signal by altering the initial scattering wave function, increasing the overlap with the final excited-state bound wave function. We focus on the purely triplet 0_g^- state of Rb_2 that connects asymptotically to the $5^2S_{1/2}+5^2P_{1/2}$ separated-atoms limit, due to its simple electronic structure. We trap ultracold atoms undergoing photassociation with and without the presence of a Feshbach resonance. We provide absolute photoassociation rates into vibrational states of excited electronic states that are inaccessible with conventional spectroscopy using a close-coupled scattering calculation. We specifically investigate the dependence on magnetic field, frequency, and polarization.

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