Abstract Submitted
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A New Approach for Two Photon Ground State Spectroscopy of Ultracold 6Li40K molecules[1] YANG ANBANG, SOFIA BOTSI, SUNIL KUMAR, SAMBIT PAL, MARK LAM, Centre for Quantum Technologies,National University of Singapore, ANDREW LAUGHARN, University of Maryland, KAI DIECKMANN[2], Centre for Quantum Technologies,National University of Singapore, QUANTUM MATTER GROUP TEAM — Ultracold bi-alkaline dipolar molecules have attracted wide attention for long lifetime and large permanent electric dipole moment, which makes them good candidates for future application in Quantum Simulation, Quantum computation and Metrology. Scientists have been trying to transfer these ultracold molecules, which are often formed by Feshbach association, to their absolute ro-vibronic ground state using Stimulated Rapid Adiabatic Passage(StiRAP). StiRAP requires a hyperfine resolved 3 level energy structure. In order to find the optimal path from ground state to excited state, one photon loss spectroscopy and 2 Photon Alter Townes Spectroscopy is often performed. In previous experiments, people were using a strongly singlet/triplet mixed excited vibrational state as a intermediate state. To find the correct path to ground state, it requires much effort to pick 1 single hyperfine state among tens of hyperfine states. In our lab, we are using a different method. Starting from a stretched Feshbach state, we pick a pure singlet state as our intermediate state for StiRAP. Using these method, we won't be confused by the hyperfine structure of one photon loss spectroscopy. This method can also be applied to other ultracold molecule group.

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