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Towards STIRAP transfer of ^{6}Li-^{40}K to the ground state using a frequency comb based Raman laser system

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^{6}Li-^{40}K molecules in its absolute ground state have a large dipole moment of 3.6 debye, which makes them a suitable candidate for investigating long range dipole-dipole interactions. Starting from ^{6}Li-^{40}K Feshbach molecules we plan to transfer them to the ground state using stimulated Raman adiabatic passage (STIRAP). A Raman laser system comprising of two lasers at 767 nm and 522 nm respectively, has been developed for spectroscopy and for the STIRAP transfer of ^{6}Li-^{40}K. To ensure high relative phase coherence necessary for STIRAP, the two lasers have been locked to a common high finesse cavity. To nullify slow cavity drifts, a single feedback loop provides frequency corrections to both the lasers. The feedback signal is obtained by measuring the repetition rate of a frequency comb, optically locked to one of the Raman lasers and comparing it to a GPS-disciplined RF oscillator. In this talk, we present our results on the short and long-term stability of the Raman laser system. Additionally, we summarize our calculations of Franck-Condon factors for the selection of states suitable for STIRAP, and provide updates on the status of the experiment.

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