Abstract Submitted
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Increasing the filling fraction of ultracold polar KRb molecules in a 3D optical lattice[1] STEVEN MOSES, BRYCE GADWAY, BO YAN, JACOB COVEY, DEBORAH JIN, JUN YE, JILA, NIST, and University of Colorado at Boulder — Gases of ultracold polar molecules with sufficiently low entropy are an ideal experimental scenario to look for signatures of long-range many-body interactions. Having a high filling fraction in a 3D lattice is one way to achieve a low entropy state. In earlier work, we showed that preformed pairs of K and Rb in a 3D lattice (sites that have exactly one K and one Rb) are converted to KRb Feshbach molecules with nearly 100% efficiency. Since the STIRAP transfer from Feshbach molecules to ground-state molecules is 90-100% efficient, loading a 3D lattice with a large fraction of preformed pairs will lead to a large filling fraction of ground-state molecules. Our scheme is to load a Mott insulator of Rb and band insulator of K. After we have loaded a lattice with a high filling fraction, we will investigate effects of dipolar interactions in a many-body system.

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