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Towards a low entropy gas of fermionic polar molecules BRYCE GADWAY, STEVEN MOSES, BO YAN, JACOB COVEY, DEBORAH JIN, JUN YE, JILA, NIST, and University of Colorado-Boulder — In recent years, ultracold gases of polar molecules have garnered much attention, owing in part to their prospects for emulating condensed matter systems with long-range interactions. To enable the observation of long-range dipolar interactions, which has so far been precluded by insufficient molecular densities, we aim to create a high-filling-fraction sample of ground state polar KRb molecules in a three-dimensional optical lattice. This can be accomplished by disposing an initial Bose–Fermi lattice mixture towards the formation of preformed pairs - one boson and one fermion per lattice site - via control over the interspecies interactions, followed by efficient conversion to deeply bound ground state molecules. To characterize the entropy in our system, we shall study two-body losses due to reactive collisions occurring in molecular rotational-state mixtures.

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