Abstract Submitted
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Suppressing the loss of ultracold molecules via the continuous quantum Zeno effect[1] BIHUI ZHU, BRYCE GADWAY, MICHAEL FOSS-FEIG, JOHANNES SCHACHENMAYER, MICHAEL WALL, KADEN HAZZARD, BO YAN, STEVEN MOSES, JACOB COVEY, DEBORAH JIN, JUN YE, MURRAY HOLLAND, ANA MARIA REY, JILA — We develop theoretical methods to explain the recently observed suppression of chemical reactions between two rotational states of fermionic KRb molecules confined in 1D tubes with a superimposed optical lattice along them [Yan *et al.*, Nature 501, 521 (2013)]. The loss suppression is a consequence of both lattice confinement and the continuous quantum Zeno effect, which in this case takes place in the regime where the two-body loss is larger than other energy scales in the lattice. To quantitatively analyze the experiment, we derive a renormalized single-band model which accounts for 3D multi-band effects, and formulate from it a rate equation and mean-field theory validated by comparing with numerically exact t-DMRG. We demonstrate that the renormalized model captures the measured dependence of the loss rate on all lattice parameters, allowing us to determine the filling fraction.

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