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Lifetime of ^{6}Li^{40}K dimers near a Feshbach resonance[1] MICHAEL JAG, MARKO CETINA, RIANNE LOUS, Inst. for Quant. Opt. and Quant. Inf., Innsbruck and Inst. for Exp. Phys., Univ. of Innsbruck, JESPER LEVINSEN, School of Physics and Astronomy, Monash Univ., DMITRY PETROV, LPTMS, CNRS, Univ. Paris Sud, Univ. Paris-Saclay, RUDOLF GRIMM, IQOQI and Inst. for Exp. Phys., Innsbruck — We investigate the lifetime of bosonic dimers formed in a Fermi- Fermi mixture of ^{6}Li and ^{40}K atoms near a Feshbach resonance. Pure dimer samples are created from a Li-K mixture by ramping a magnetic field across the resonance and removing unbound atoms. We then perform lifetime measurements using both trapped high-density as well as expanding low-density samples after release from the trap. These measurements discriminate between the spontaneous and the collisional dimer decay. We further determine the dimer decay due to Li-LiK collisions in an atom-dimer mixture. Our measurements reveal a more than three-fold (five-fold) decrease in decay due to dimer-dimer (atom-dimer) collisions as the Feshbach resonance is approached. This observation is in good agreement with a theoretical prediction, which relates the decay rate to the probability of finding the colliding atoms within a short distance, and can mostly be explained by the increased fermionic character of the halo-dimer state together with Pauli blocking. We apply our model to combinations of other fermionic species to predict the dimer lifetime, which is an important parameter for their prospect towards realizing novel quantum phases.

[1]SFB FoQuS

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