Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Dynamics of a Repulsive Fermi-Fermi Mixture MARKO CETINA, MATTEO ZACCANTI, IQOQI, Austrian Acad. of Sciences, Innsbruck, MICHAEL JAG, CHRISTOPH KOHSTALL, IQOQI, Austrian Acad. of Sciences and Inst. for Exp. Physics, Univ. Innsbruck, ANDREAS TRENKWALDER, FLORIAN SCHRECK, IQOQI, Austrian Acad. of Sciences, Innsbruck, RUDOLF GRIMM, IQOQI, Austrian Acad. of Sciences and Inst. for Exp. Physics, Univ. Innsbruck
— There is a growing interest in repulsively interacting Fermi gas mixtures, which could enable investigations of correlated quantum systems. As repulsive interactions in Fermi gases near a Feshbach resonance arise from the presence of a loosely bound molecular state, they are always associated with decay into bosonic molecules [1]. The interplay between repulsion and decay has made the realization and understanding of repulsive Fermi systems challenging [2,3]. We investigate the dynamics of a strongly interacting ^{40}K-^{6}Li Fermi-Fermi mixture on the repulsive side of an interspecies Feshbach resonance. For this purpose, we employ magnetic field ramps, RF spectroscopy, in-situ and time-of-flight imaging. Close to the resonance, we observe a static behavior of the K atomic population, redistribution of the Li density away from the K cloud and an absence of the interaction-induced shifts in the dissociation RF spectra in the strongly interacting repulsive regime. In spite of a strong initial atom loss, our results suggest that repulsive interactions are crucial for the dynamics of our system.

[1] D. Pekker, et al., *Phys. Rev. Lett.* **106**, 050402 (2011).
[2] G. Jo, et al., *Science* **325**, 5947 (2009).
[3] C. Sanner et al., arXiv:1108.2017

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Date submitted: 27 Jan 2012 Electronic form version 1.4