Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Hydrodynamic Expansion of a Strongly Interacting Fermi-Fermi Mixture ANDREAS TRENKWALDER, IQOQI, Austrian Acad. of Sciences, Innsbruck, CHRISTOPH KOHSTALL, IQOQI, Austrian Acad. of Sciences and Inst. for Exp. Physics, Univ. Innsbruck, MATTEO ZACCANTI, IQOQI, Austrian Acad. of Sciences, Innsbruck and LENS, Physics Dept., Univ. of Florence and INO-CNR, Sesto Fiorentino, Italy, DEVANG NAIK, IQOQI, Austrian Acad. of Sciences, Innsbruck, ANDREI SIDOROV, Swinburne Univ. of Technology, Melbourne, Australia, FLORIAN SCHRECK, IQOQI, Austrian Acad. of Sciences, Innsbruck, RUDOLF GRIMM, IQOQI, Austrian Acad. of Sciences and Inst. for Exp. Physics, Univ. Innsbruck — We report on the expansion of an ultracold Fermi-Fermi mixture of ^{6}Li and ^{40}K under conditions of strong interactions controlled via an interspecies Feshbach resonance. We study the expansion of the mixture after release from the trap and, in a narrow magnetic field range, we observe two phenomena related to hydrodynamic behavior. The common inversion of the aspect ratio is found to be accompanied by a collective effect where both species stick together and expand jointly despite of their widely different masses. Our work constitutes a major experimental step for a controlled investigation of the many-body physics of this novel strongly interacting quantum system.

Andreas Trenkwalder
IQOQI, Austrian Acad. of Sciences, Innsbruck and Inst.
for Exp. Physics, Univ. Innsbruck

Date submitted: 02 Feb 2011 Electronic form version 1.4