Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Ultracold Cesium Feshbach Molecules MICHAEL MARK, STEVEN KNOOP, FRANCESCA FERLAINO, MARTIN BERNINGER, HARALD SCHÖBEL, HANNS-CHRISTOPH NÄGERL, RUDOLF GRIMM, University of Innsbruck, Austria — We present our recent work on ultracold Cesium Feshbach molecules in an optical dipole trap. We have implemented a new crossed-beam laser trap, which traps atoms and molecules simultaneously. By scanning one laser beam the ellipticity can be dynamically tuned for an optimal trap configuration. We routinely prepare ultracold mixed atomic and molecular or pure molecular samples at temperatures down to 30 nK [1]. We selectively populate Feshbach molecules in various s-, d-, g- and even l-wave states [2]. We have experimentally demonstrated that the l-wave dimers can be stable against spontaneous decay on the timescale of one second well above the dissociation threshold [3]. We have recently implemented the technique of resonantly modulated magnetic field spectroscopy [4]. Transitions between the atomic continuum and dimer states, and vice versa, as well as dimer-dimer transitions can be driven. Our main motivation is to apply this technique to search for trimer and tetramer states, whose presence has been indicated by resonances in collisional loss measurements.
[1] F. Ferlaino et al., in preparation; [2] M. Mark et al, Phys. Rev. A 76, 042514 (2007); [3] S. Knoop et al., arXiv:0710.4052; [4] T. M. Hanna et al., Phys. Rev. A 75, 013606 (2007)

Michael Mark
University of Innsbruck, Austria

Date submitted: 03 Dec 2007 Electronic form version 1.4