

MAR08-2007-001377

Abstract for an Invited Paper
for the MAR08 Meeting of
the American Physical Society

Collisions of ultracold molecules

HANNS-CHRISTOPH NAEGERL, University of Innsbruck

In our experiments we routinely produce ultracold trapped samples of dimer molecules out of a Cs atomic gas by exploiting the atom-dimer coupling near Feshbach resonances. We explore the rich molecular structure for the Cs dimers near the atomic threshold by consecutive state transfer after initial dimer production and produce atom-dimer mixtures for which we measure the atom-dimer collisional rate as a function of magnetic field at temperatures down to 40 nK. We find resonant enhancement of this rate for sufficiently small dimer binding energies for which coupling to an Efimov trimer state is possible. We also produce pure dimer samples for which we measure the collisional loss rate. For a weakly bound molecular s-state this rate depends strongly on temperature and on the applied magnetic field. We will also discuss first results from our experiment on producing ultracold ro-vibrational ground state molecules for the case of Cs dimers and RbCs starting from weakly bound molecules which initially are produced on a Feshbach resonance.