Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Elastic and Inelastic Collisions of Single Cs Atoms with an Ultracold Rb Cloud FARINA KINDERMANN, Department of Physics, TU Kaiserslautern, NICOLAS SPETHMANN, DIETER MESCHEDE, IAP, Uni Bonn, ARTUR WIDERA, Department of Physics, TU Kaiserslautern — Ultracold gases doped with impurity atoms are promising hybrid systems that pave the way for investigation of a series of novel and interesting scenarios: They can be employed for studying polaron physics, the impurity atoms can act as coherent probes for the many-body system, and the coherent cooling of neutral atoms containing quantum information has been proposed. Here, we immerse single and few Cs atoms into an ultracold Rb cloud. Elastic collisions lead to rapid thermalization of both sub-systems, while inelastic collisions lead to a loss of Cs from the trap. When thermalized, the impurity atom is localized inside the Rb gas. The ultracold Rb gas remains effectively unaffected by the interaction with the Cs impurity atoms. The poster will present details of the experimental setup, sequence and data analysis needed to extract the interspecies scattering length and three-body loss coefficient from the thermalization dynamics and loss rates measured.

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Date submitted: 17 Jan 2012 Electronic form version 1.4