

Abstract Submitted  
for the DAMOP15 Meeting of  
The American Physical Society

**Measurement and simulation of scattering properties of dysprosium** YIJUN TANG, NATHANIEL BURDICK, BENJAMIN LEV, Stanford University, ANDREW SYKES, JOHN BOHN, JILA; NIST; University of Colorado, Boulder — Ultracold collisions can often be characterized by a single parameter, the  $s$ -wave scattering length  $a$ , but despite the simplicity of this model, the scattering length  $a$  often must be determined experimentally, even for alkali atoms. For highly magnetic lanthanide atoms such as dysprosium (Dy,  $10 \mu_B$ ), the dipolar interaction may strongly affect the scattering properties and must also be taken into account. We have characterized the elastic cross-section for scattering between ultracold Dy atoms by measuring the rethermalization rate in a Dy clouds driven out of equilibrium. The experimental data agree well with numerical simulations based on Boltzmann equations that include the dipolar interaction contribution. Our recent work on observations of inelastic dipolar scattering will also be briefly discussed.

[1] N. Burdick, K. Baumann, Y. Tang, M. Lu, and B. L. Lev, Phys Rev Lett **114**, 023201 (2015).

Benjamin Lev  
Stanford University

Date submitted: 02 Feb 2015

Electronic form version 1.4