

Abstract Submitted
for the DAMOP09 Meeting of
The American Physical Society

Four-body Efimov effect predicted in a two-component ultracold gas¹ YUJUN WANG, W. BLAKE LAING, B.D. ESRY, Department of Physics, Kansas State University — Contrary to decades-old predictions that the Efimov effect does not generalize to four-body systems, we have identified a four-body Efimov effect in essentially exact numerical solutions of the four-body problem. We build upon existing results for three-body Efimov physics by applying a Born-Oppenheimer approximation to a system of three (identical) heavy atoms H interacting with a light atom L . We have found that as the first HHL three-body bound state forms, four-body bound states with energies bearing the Efimov scaling signature start accumulating. When the three-body states are weakly bound Efimov states, we observe embedded three-body and four-body Efimov features in $HL + H + H$ recombination rates and also in $HHL + H$ relaxation rates. We will discuss the significance of four-body Efimov physics for both few-body theory and for experiments with two-component ultracold gasses.

¹Supported by the National Science Foundation and Air Force Office of Scientific Research

Yujun Wang
Department of Physics, Kansas State University

Date submitted: 27 Jan 2009

Electronic form version 1.4