DAMOP10-2010-000533

Abstract for an Invited Paper
for the DAMOP10 Meeting of
the American Physical Society

Universality of few-body systems: Four-body and beyond[1]

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Weakly-bound few-body systems have been studied extensively by the atomic, nuclear and condensed matter communities since the early days of quantum mechanics. Intriguingly, under certain circumstances these systems behave universal, i.e., their behavior is independent of the details of the underlying two-body interactions. Over the past few years, several experimental groups have reported observations of universal aspects of three- and four-body systems under controlled conditions, motivating further theoretical work. This talk summarizes our recent theoretical studies on universal few-particle systems consisting of four or more particles. We will discuss the energetics and structural properties of extremely weakly-bound few-boson systems consisting of four or more particles and discuss their connection to Efimov trimers. Furthermore, the universal properties of trapped equal-mass few-fermion systems will be illustrated. Lastly, a discussion of the universal behavior of two-component Fermi systems with unequal masses will be presented.

[1]Support by the NSF and the ARO is gratefully acknowledged.