Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

A new class of three-body states beyond the Efimov effect[1] NICOLAIS L. GUEVARA, BRETT D. ESRY, Department of Physics. Kansas State University — Recently, we have identified a new type of three-body bound state for three identical bosons interacting via attractive two-body $1/r^2$ potentials [1]. These three-body states are bound even when the two-body subsystem does not support a dimer state. In fact, there are an infinity of such states. We will present an extension of this work to the system with two identical bosons (B) and one distinguishable particle (X). We have investigated the spectrum of this BBX system assuming only that the $B + X$ interaction is an attractive $1/r^2$ potential. We have again found an infinite number of three-body bound states even though the two-body potential does not support a bound state. This effect is shown to exist at large mass ratios (M_B/M_X) and depends on the strength of the two-body interaction. The most favorable case is the molecular-type system, i.e., $M_B/M_X \gg 1$. While these new three-body states resemble Efimov states they originate from fundamentally different physics.

[1] N. L. Guevara, Yujun Wang, and B. D. Esry, arXiv:1110.0476 (2011)

[1]Supported by the National Science Foundation

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Date submitted: 31 Jan 2012 Electronic form version 1.4