## **Critical Stability 2011**



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## Universality of unstable bosonic tetramers

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Few-particle systems with resonant interactions, i.e., large
two-particle scattering length, possess a number of universal properties and correlations between observables.
We focus on the four-boson system,
in particular, on the two tetramer states associated with each
Efimov trimer. However, only the two lowest tetramers
are true bound states; all higher tetramers lie above the atom-trimer threshold and therefore are unstable
bound states.
Thus, a proper description of the four-particle continuum is needed.
We use exact Alt, Grassberger, and Sandhas four-body scattering
equations that are solved in the momentum-space framework.
Universal relations are obtained for various atom-trimer and dimer-dimer scattering
observables: scattering lengths, effective range parameters,
elastic anf inelastic cross sections. Their behavior is greatly affected by the unstable tetramer states whose
properties are thereby extracted from the atom-trimer and dimer-dimer scattering results [1].

[1] A. Deltuva, Phys. Rev. A 82, 040701(R) (2010).

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