Universality in the Four-Body System in an EFT Framework

Christiane Schmickler[(a)], Hans-Werner Hammer[(a)]

[(a)] HISKP, Univ. Bonn, Germany

Particles with a large scattering length have universal low-energy properties that do not depend on the details of their structure or their interactions at short distances [1]. In the four-body system, there is theoretical evidence for a pair of universal four-body states connected to each three-body Efimov state. Recent experiments with ultracold atoms have observed these states through their manifestation in few-body loss rates [2] and triggered new theoretical work on universality in few-body systems [3]. We will present first results of a new investigation of four-body systems in the framework of effective field theory [4].

[1] E. Braaten and H.-W. Hammer, Phys. Rep. **428** (2006) 259.

[2] F. Ferlaino et al., Phys. Rev. Lett. **102** (2009) 140401.
S.E. Pollack et al., Science **326** (2009) 1683.

[3] See e.g. B.J. Avila and M.C. Birse, arXiv:1304.5454 and references therein.

[4] Ch. Schmickler and H.-W. Hammer, work in progress.

E-mail: schmickler@hiskp.uni-bonn.de