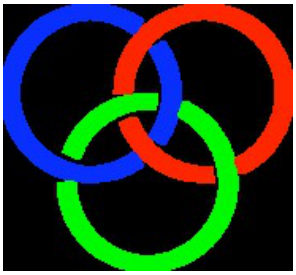

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Universal and non-universal Efimov physics with strongly interacting atoms

mardi 11 octobre 2011 09:00 (40 minutes)

We observed the existence of a universal regime for Efimov trimers through three-body recombination loss in the vicinity of a Feshbach resonance, for ultracold Li-7 atoms. The reported results crucially depend on a careful mapping of the scattering length on the magnetic field. We characterize two broad Feshbach resonances in different spin states via the binding energies of weakly bound molecules, created by radio-frequency association, by making use of a theoretical coupled channels analysis.

We also investigate the possibility to stabilize Efimov trimers in optical lattices. We present universal solutions of three bosons in a harmonic potential, for all ranges of the scattering length and harmonic oscillator length. We compare our results to the limiting cases, such as that of a vanishing trapping potential. The combination of being able to tune both length parameters gives rise to quite distinct solutions of these trimers, and allows for minimizing the inelastic losses.

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