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Efimov physics in an ultracold Bose-Fermi mixture with large mass imbalance[1]

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An ultracold Bose-Fermi mixture of Cs and Li atoms constitutes a prototypical system with large mass imbalance that allows the exploration of many intriguing phenomena in few- and many-body physics. One of such is the heteronuclear Efimov effect, due to which an infinite geometrical series of bound three-body states can be formed, given that the two-body interactions are resonant. Here we present the recent observations of consecutive Efimov resonances through measurements of three-body loss coefficients near the broad Feshbach resonance.[2] A refined analysis of the Feshbach resonance[3] allows us to obtain an improved determination of the scaling of the Efimov resonances, which slightly deviates from the predicted universal scaling factor for the LiCs system. In a recent study, we have determined the effect of the Cs-Cs scattering length on the three-body parameter of the Efimov resonances.

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[2]R. Pires *e*t al., PRL 112, 250404 (2014); PRA 90, 012710 (2014). See also: S.-K. Tung *et al.*, PRL 113, 240402 (2014).
[3]J. Ulmanis *e*t al., arXiv:1501.04799.