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Long-range Efimov states¹ B.D. ESRY, Dept. of Physics, Kansas State University, Manhattan, KS 66506, J.P. D'INCAO, JILA, University of Colorado, Boulder, CO 80309 — We have identified a new class of Efimov states that appear in heteronuclear three-body systems where both intra- and interspecies interactions are resonant. Besides their peculiar geometry, we speculate that such states should be truly universal. That is, their properties should only depend on the scattering lengths. These states' long-range character forbids them to see the details of the interatomic interactions, which normally introduces an extra parameter into expressions relating to “ordinary” Efimov states. In the context of ultracold gases with tunable interactions, we thus believe that it is possible to predict precisely when such states should appear. Consequently, the observation of a single state would be enough to demonstrate the Efimov effect.

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