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Origin of the Universal Three-body Parameter in Atomic Efimov Physic PASCAL NAIDON, RIKEN, SHIMPEI ENDO, MASAHITO UEDA, The University of Tokyo — Several experiments [1] with different kinds of ultra-cold atoms have revealed that the three-body parameter that fixes the Efimov spectrum of few-atom systems near broad Feshbach resonances is universally determined by the atoms' van der Waals length. Using model potential calculations we find that the three-body parameter originates from a deformation of the three-atom system due to universal two-body correlations at separations on the order of the van der Waals length scale [3]. This simple physical picture is consistent with the universality of the three-body parameter observed in the experiments [1], as well as previous numerical calculations [2]. It explains why the low-energy physics of three bosonic atoms near a broad resonance is solely determined by their two-body parameters.

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