

Abstract Submitted
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Universal three-body physics at finite energies¹ YUJUN WANG, JILA and Department of Physics, University of Colorado at Boulder and Department of Physics, Kansas State University, J.P. D'INCAO, JILA and Department of Physics, University of Colorado at Boulder, B.D. ESRY, Department of Physics, Kansas State University, CHRIS H. GREENE, JILA and Department of Physics, University of Colorado at Boulder — We discuss the universal three-body scattering physics for cold atoms up to energies far beyond the ultracold limit. We have found universal features in the energy-dependence of the three-body recombination rates which can be traced to Efimov physics. These new features, however, have different character for positive and negative scattering length (a) because the high partial wave contributions are very different. In particular, we show that for $a > 0$, the very high partial wave contributions are still important in a certain energy range. For $a < 0$, however, the S -wave contribution is dominant up to the highest energy where the three-body recombination is universal. We also discuss modifications of the universal three-body physics that arise near a narrow Feshbach resonance. Our results provide a complete picture for the universal features in the three-body recombination, and will assist the experimental study of the universal three-body physics under very different experimental conditions.

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