Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Three-body recombination in a quasi-two-dimensional quantum gas[1] BO HUANG, Institut für Quantenoptik und Quanteninformation (IQOQI), Österreichische Akademie der Wissenschaften, 6020 Innsbruck, Austria, ALESSANDRO ZENESINI, Institute of Quantum Optics, Leibniz Universität Hannover, 30167 Hannover, Germany, RUDOLF GRIMM, Institut für Experimentalphysik, Universität Innsbruck, 6020 Innsbruck, Austria — Quantum three-body recombination in three-dimensional systems is influenced by a series of weakly bound trimers known as Efimov states, which are induced by short-range interactions and exhibit a discrete scaling symmetry. On the other hand, two-dimensional systems with contact interactions are characterized by continuous scale invariance and support no Efimov physics. This raises questions about the behaviour of three-body recombination in the transition from three to two dimensions. We use ultracold caesium atoms trapped in anisotropic potentials formed by a pair of counter-propagating laser beams to experimentally investigate three-body recombination in quasi-two-dimensional systems with tunable confinement and tunable interactions. In our recent experiments, we observed a smooth transition of the three-body recombination rate coefficient from a three-dimensional to a deeply quasi-two-dimensional system. A comparison between the results obtained near two Feshbach resonances indicates a universal behaviour of three-body recombination in the quasi-two-dimensional regime.

[1]Austrian Science Fund FWF within project P23106

Bo Huang
IQOQI, Innsbruck, Austria

Date submitted: 28 Jan 2016 Electronic form version 1.4