EINLADUNG
ZUM LASER- UND QUANTENOPTIKSEMINAR

Am Freitag, 01.06.2012, um 10:00 Uhr
Raum 46/387-388

Es spricht: Dr. Francesco Minardi
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Thema: “Dynamics of impurities in a one-dimensional Bose gas”

One-dimensional quantum gases have been sparking increasing interest for the possibility, among other things, of achieving strongly quantum correlated regimes. The addition of impurities in one-dimensional systems is particularly effective to both manipulate and probe. In a recent experiment [1], we have used a largely imbalanced mixture of K41 and Rb87 to create impurities in a one-dimensional gas of bosons. The impurity K41 atoms, initially localized by means of a species-selective optical potential, were abruptly released and let expand and oscillate in the one-dimensional harmonic potential, while interacting with the surrounding bath of Rb87 atoms. Thanks to Feshbach resonances, modified by the confinement, we adjusted the interspecies coupling constant $g_{1d}$ between impurity and bath, and we observed a clear-cut dependence of the amplitude of the oscillations on $g_{1d}$, whereas the oscillation frequency was constant within experimental uncertainties.

While a conclusive explanation is still lacking, we propose a theoretical analysis that, under simplifying approximations, captures the main features of the experimental findings in terms of a polaronic mass-shift model formulated following Feynman variational method [2].


Der Gast wird betreut von Prof. Dr. H. Ott
GÄSTE SIND HERZLICH WILLKOMMEN!