Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Exact mapping between different dynamics of isotropically trapped quantum gases[1] ETIENNE WAMBA, AXEL PELSTER, JAMES R. ANGLIN, State Research Center OPTIMAS and Fachbereich Physik, Technische Universitt Kaiserslautern — Experiments on trapped quantum gases can probe challenging regimes of quantum many-body dynamics, where strong interactions or non-equilibrium states prevent exact theoretical treatment. In this talk, we present a class of exact mappings between all the observables of different experiments, under the experimentally attainable conditions that the gas particles interact via a homogeneously scaling two-body potential which is in general time-dependent, and are confined in an isotropic harmonic trap. We express our result through an identity relating second-quantized field operators in the Heisenberg picture of quantum mechanics which makes it general. It applies to arbitrary measurements on possibly multi-component Bose or Fermi gases in arbitrary initial quantum states, no matter how highly excited or far from equilibrium. We use an example to show how the results of two different and currently feasible experiments can be mapped onto each other by our spacetime transformation. DAMOP sorting category: 6.11 Nonlinear dynamics and out-of-equilibrium trapped gases

[1]EW acknowledge the financial support from the Alexander von Humboldt foundation

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Date submitted: 29 Jan 2016 Electronic form version 1.4