

Michael Hofacker (IADM, University of Stuttgart)

August 8, 2019

Potential approximation of the one-dimensional Bose gas with contact interactions

Abstract: In this talk a Bose gas with δ -interactions in one space dimension is considered. We prove that the Hamiltonian of this system, which is defined by a closed semi-bounded quadratic form, naturally arises as a resolvent limit $\varepsilon \downarrow 0$ of Schrödinger operators H_ε , where the corresponding two-body potentials scale like a Dirac sequence in $\varepsilon > 0$. We estimate the rate of norm convergence of the resolvents depending on the decay of the potential at infinity. Our results extend previous results of Basti et al., concerning the three-body case, to the case of an arbitrary number of bosons $N \in \mathbb{N}$. This is based on joint work with Marcel Griesemer and Ulrich Linden.