

Abstract Submitted
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The density profile of interacting Fermions in a one-dimensional optical trap¹ SEBASTIAN EGGERT, Univ. of Kaiserslautern, Germany, STEFAN SOEFFING, Univ of Kaiserslautern, Germany — The density distribution of the Hubbard model in a one-dimensional external harmonic potential is investigated in order to study the effect of the confining trap. The broadening of the Fermion cloud with increasing interaction is analyzed in detailed, which can be described by a surprisingly simple scaling form. Strong superimposed “Friedel” oscillations are always present despite the absence of any hard wall boundaries. The wavelength of the dominant oscillation changes with interaction, which indicates the crossover to a spin-incoherent regime. We present an analytical formula, which describes the behavior of the oscillations very well for all interactions strengths and in return gives some insight for the use of bosonization in a trapping potential.

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