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**Exact numerical simulations of interacting fermions in 1D trapping potentials** BERND SCHMIDT, DOMINIK MUTH, ALEXANDER MERING, MICHAEL FLEISCHHAUER, Fachbereich Physik, Technische Universität Kaiserslautern, Germany — We discuss p-wave interacting spin-polarized fermions in a 1D trapping potential for arbitrary interaction strength. Using a boson-fermion mapping in 1D, interacting fermions with p-wave interaction strength  $g_{1D}^F$  can be mapped to bosons with s-wave interaction strength  $g_{1D}^B = -1/g_{1D}^F$ . As a consequence a weakly interacting Fermi gas behaves in local properties like a strongly interacting Bose gas and vice versa. We derive a proper discretized model for the interacting fermions and compare its predictions with that obtained by the Bose-Fermi mapping using DMRG and TEBD simulations. We calculate the realspace and momentum distributions of the fermions for the whole range of interaction strength starting at a weakly interacting gas going to the Fermi-Tonks limit and compare the results to predictions from field theoretical approaches.

Dominik Muth  
Fachbereich Physik, Technische Universität Kaiserslautern, Germany

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