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Investigation of the 1+1 dimensional Thirring model using the method of matrix product states

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We present results from our study of the 1+1 dimensional Thirring model employing the techniques of Matrix Product States. As the first step of a research programme for examining this model with the Hamiltonian formalism on the lattice, we determine the phase structure of the theory. In particular, we confirm the existence of the critical phase in the Thirring model in two dimensions. This is achieved by computing the mass gap, the chiral condenstate, the entanglement entropy, as well as the fermion correlator.

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