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Mitigating the sign problem for non-relativistic fermions on the lattice ANDREI KRYJEVSKI, North Dakota State University — We study the fermion sign problem in a theory of non-relativistic fermions with a spin-independent repulsive interaction. We work in polar co-ordinates in momentum space, which makes it straightforward to keep only the low-energy degrees of freedom close to the Fermi surface. This is sufficient for the purpose of calculating many physically important low-energy observables. We find indications that the sign problem in the high-density effective theory will be weaker than in the full theory, so low-energy properties of the theory could be calculated by modifying the action to make it positive semi-definite and including reweighting factors in the observables. We discuss suitable modifications of the action, and describe a possible lattice realization of the polar momentum space formulation of the theory.

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