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The imbalanced Fermi gas at unitarity

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Lattice field theory is a useful tool for studying strongly interacting theories in condensed matter physics. A prominent example is the unitary Fermi gas: a two-component system of fermions interacting with divergent scattering length. With Monte Carlo methods this system can be studied from first principles. In presence of an imbalance (unequal number of particles in the two components) a sign problem arises, which makes conventional algorithms inapplicable. We will show how to apply reweighting techniques to generalise the recently developed worm algorithm to the imbalance case, and present results for thermodynamic observables, in particular the critical temperature, for equal, as well as unequal number of fermions in the two spin components.

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talk

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