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# The multi-flavor Schwinger model with chemical potential - Overcoming the sign problem with Matrix Product States

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During recent years there has been quite some interest in applying Matrix Product States and more general tensor networks to lattice gauge theories in the Hamiltonian formulation. Previous work already demonstrated the power of this approach by computing the mass spectrum and thermal sates for the Schwinger model, and also real-time dynamics for abelian and non-abelian gauge models have been successfully addressed in the meantime.

In this talk we present ground state calculations for the two-flavor Schwinger model with finite chemical potential using Matrix Product States. While the conventional Monte Carlo approach suffers from the sign problem, our numerical simulations with Matrix Product States reliably reproduce analytic results for the massless case by Narayanan [Phys. Rev. D 86, 125008 (2012)] and readily extend to the massive case, where no analytic prediction is available.

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