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Bold Diagrammatic Monte Carlo for Fermionic and Fermionized Systems

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In three different fermionic cases—repulsive Hubbard model, resonant fermions, and fermionized spins-1/2 (on triangular lattice)—we observe the phenomenon of sign blessing: Feynman diagrammatic series features finite convergence radius despite factorial growth of the number of diagrams with diagram order. Bold diagrammatic Monte Carlo technique allows us to sample millions of skeleton Feynman diagrams.
With the universal fermionization trick we can fermionize essentially any (bosonic, spin, mixed, etc.) lattice system.

The combination of fermionization and Bold diagrammatic Monte Carlo yields a universal first-principle approach to strongly correlated lattice systems, provided the sign blessing is a generic fermionic phenomenon.

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