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Properties of the short ranged RVB wavefunction on non-bipartite lattices via Pfaffian Monte Carlo[1] JULIA WILDEBOER, ALEXANDER SEIDEL, Washington University in Saint Louis — We introduce a Monte Carlo scheme to investigate the nearest neighbor version of Anderson's resonating-valence-bond (RVB) spin-1/2 wave function on the kagome and on the triangular lattice. For the kagome lattice there exists a parent Hamiltonian for this state, but even in the absence of a known Hamiltonian, wave functions of RVB type are interesting as such. The corresponding RVB wave function on the square lattice has recently enjoyed much attention, and it was shown that earlier findings about the criticality of the *dimer*-liquid wave function on the square lattice qualitatively carry over to the analogous *spin*-liquid wave function on this lattice. On bipartite lattices, the spin-1/2 RVB wave functions are amenable to MC methods based on a loop gas picture. For other lattices, this method has a sign problem. We present a method that is free of this sign problem, making use of a Pfaffian presentation of the wave function in the orthogonal Ising basis. Our results for both open and periodic boundary conditions show that spin-spin and "dimer-dimer" type correlation function are exponentially decaying. Time and/or results permitting, we also comment on the behavior of the monomer correlations, and mention possible applications of our method to other problems.

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