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Theory of spin liquid on the kagome lattice and application to $ZnCu_3(OH)_6Cl_2$: Projected wavefunction study[1] YING RAN, MICHAEL HERMELE, PATRICK A. LEE, XIAO-GANG WEN, MIT — Recent experiments on $ZnCu_3(OH)_6Cl_2$ have drawn new attention to the ground state of the spin-1/2 kagome lattice antiferromagnet. We have examined this issue using Gutzwiller projected fermion wavefunctions, and propose that the ground state is described by the projection of fermions hopping on the kagome lattice in a background π-flux on the hexagons and zero flux on the triangles. This state has gapless Dirac points and is an algebraic spin liquid. Properties of the wavefunction and low-energy excitations will be discussed, with a focus on application to the experiments.

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