

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Valence Bond States on the kagome lattice: Linear Independence and RVB-Hamiltonian¹ ALEXANDER SEIDEL, Department of Physics and Center for Materials Innovation, Washington University, St. Louis, MO 63136, USA — A local $SU(2)$ -invariant Hamiltonian on the kagome lattice is constructed for which the four Sutherland-Rokhsar-Kivelson-type spin-1/2 resonating valence bond (RVB) states on the torus are ground states. The uniqueness of these ground states within the subspace of nearest-neighbor valence bond states can be demonstrated, as opposed to the case of Klein-type models. The proof depends on the linear independence of the nearest-neighbor valence bond states on the (arbitrarily large) kagome lattice. This linear independence property can be demonstrated using tools that are of a piece with those leading to the construction of the RVB-Hamiltonian. The likely uniqueness of the RVB ground states within the full Hilbert space is also discussed. [Reference: A. Seidel, Phys. Rev. B 80, 165131 (2009).]

¹This work was supported by the National Science Foundation under Grant No. DMR-0907793.

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Date submitted: 03 Dec 2009

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