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Many-Variable Variational Monte Carlo Study of Triangular Hubbard Model with Next-Nearest-Neighbor Hopping RYUI KANEKO, Department of Applied Physics, University of Tokyo, SATOSHI MORITA, Institute for Solid State Physics, University of Tokyo, MASATOSHI IMADA, Department of Applied Physics, University of Tokyo — Motivated by previous numerical studies on the triangular Hubbard model, we study how next-nearest-neighbor hopping affects the ground states of the model at half filling by using the many-variable variational Monte Carlo method. We consider the fermionic type variational wave functions with the Gutzwiller-Jastrow factor and the projection that restore the lattice point group symmetry. We find that the spin liquid state, sandwiched by the metallic state and the antiferromagnetic insulating states with 120° or stripe spin structure, becomes more stable as the negative next-nearest-neighbor hopping increases. By using the total momentum projection scheme, we also find that the spin liquid state is characterized by nearly gapless excitations in extended total momenta. Possible nature of the present spin liquid state is discussed.

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