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MERA Study of Spatially Anisotropic Triangular Antiferromagnets KENJI HARADA, Graduate School of Informatics, Kyoto University, Japan, NAOKI KAWASHIMA, Institute for Solid State Physics, University of Tokyo, Japan — We report variational calculations for the ground states in the spatially anisotropic triangular antiferromagnets. The variational wave function is based on the tensor network with an entanglement renormalization [1]. The entanglement renormalization improves the ability of describing a quantum state. We construct a three-dimensional MERA tensor network for the triangular lattice models. The model in this study has two groups of the antiferromagnetic Heisenberg couplings on a triangular lattice: one on links along a lattice axis and the other on other links. J_1 and J_2 denote the coefficient of their couplings, respectively. We calculate the ground states of finite lattices ($N = 114, 2166$) and an infinite lattice. We confirm a magnetic phase in the region of $0.7 < J_2/J_1 \leq 1$. The magnetic structure is incommensurate, and the wave vector is not consistent with that of a classical model except for $J_1 = J_2$.

[1] G. Vidal, Phys. Rev. Lett. 99, 220405 (2007).

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