# Plaquette renormalized tensor networks: application to frustrated systems

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Frustrated quantum spin systems pose great challenges to numerical simulations in condensed matter physics. Tensor network states appear to be good candidates as variational wave functions to obtain the ground state of 2d quantum spin system. However, the bottleneck is the huge computer resources and long CPU time required in the simulations, making it impossible to simulate large systems. On the basis of the plaquette renormalized tensor network[1], Based on a variational scheme of plaquette renormalized tensor network states, we study the transverse Ising model and J1-J2 Heisenberg models on a 2d square lattice. We compare the results with exact diagonalization in small system sizes. We also discuss the usage of GPU to speedup the tensor contraction.

## References

[1] Ling Wang, Ying-Jer Kao, and Anders W. Sandvik, arXiv:0901.0214.