Entanglement renormalization on the triangular lattice

Kenji Harada[1] and Naoki Kawashima[2]

[1] Graduate School of Informatics, Kyoto University, Kyoto 606-8501, JAPAN
[2] Institute for Solid State Physics, University of Tokyo, Kashiwanoha 5-1-5, Kashiwa, Chiba 277-8581, JAPAN

There are many interesting quantum models on the triangular lattice and the research of them is one of the most challenging area of computational condensed matter physics. However, in most cases, we encounter a serious difficulty by the conventional methods as quantum Monte Carlo, density matrix renormalization group, and exact diagonalization. In order to attack the problem, we try out the idea of entanglement renormalization(ER)[1] for triangular models. The method of ER is a special implementation of the tensor tree network. We consider the S=1/2 Heisenberg anti-ferromagnetic model on the triangular lattice and we will show results of finite and infinite triangular lattice cases.

References

[1] G. Vidal, Phys. Rev. Lett. **101**, 110501 (2008).