

# Topological properties of the spin-1/2 XXZ chain related to the SSH model

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We investigate topological properties of spin-1/2 XXZ chain with hamiltonian related to the Su-Schrieffer–Heeger (SSH) model by the Jordan-Wigner transformation [1, 2]. The SSH model exhibits localized edge states protected by non-trivial value of the Zak phase -  $Z_2$  topological invariant in 1D free electron system. This model has been intensively studied with nearest-neighbour (NN) interactions [3, 4]. The Zak phase has become no longer quantized in SSH model with interaction. It has been shown that the NN interactions can induces transitions between topologically different regimes.

In this work, we analyse the spin chain model including part related to the NN interaction by the exact diagonalization (ED) and the density matrix renormalization group (DMRG) methods. We investigate how topology of the low energy spectrum depend on the model parameter. The topological properties of this model has been examined by calculation of the Zak phase.

## References

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