# Entanglement entropy in 1D critical system with open boundaries

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It is well known that the open boundary in a one-dimensional (1D) critical system causes the Friedel oscillation in various observables including particle and energy densities. The oscillating and decaying form of the Friedel oscillations contains the information of important quantities such as the Fermi momentum and the Tomonaga-Luttinger liquid parameter and therefore is quite informative in studying the low-energy physics of the systems.

Recently, it has been pointed out that the entanglement entropy in 1D systems also exhibits the Friedel oscillation around the open boundaries. In particular, for the spin-1/2 $XXZ$ chain, it has been revealed numerically that the block-size dependence of the entanglement entropy directly relates to the spatial profile of the local energy density with high accuracy.[1] In this presentation, I will investigate in detail the open boundary effects on the entanglement entropy and other quantities in several 1D critical systems and discuss relevance of the results to the study of the systems.

## References

[1] N. Laflorencie, E. S. Sørensen, M.-S. Chang, and I. Affleck, Phys. Rev. Lett. **96**, 100603 (2006).