量子物理学・ナノサイエンス第 283 回セミナー

Integrable dissipative spin chains

講師	**:**	**桂 法称 准教授**
		東京大学 大学院理学研究科
日程	**:**	**2020 年 1 月 10 日（金）16:30–**
場所	**:**	**本館 1 階 119B 講義室**

概 要

We study two models of dissipative spin chains that can be mapped to integrable non-Hermitian models. The first model is a quantum compass chain with bulk dephasing. I will show that the Liouvillian of the system can be diagonalized exactly by mapping it to a non-Hermitian Kitaev model on a two-leg ladder. The relaxation time and the autocorrelation function of edge spins exhibit different behavior depending on whether the quantum compass Hamiltonian is in a trivial or a topological phase. The second model is a quantum Ising chain with a particular form of the bulk dissipation. In this case, the Liouvillian turns out to be a non-Hermitian Ashkin-Teller model, which can be further mapped to an XXZ spin chain with purely imaginary anisotropy Δ. In both cases, we obtain exact results for the steady states and the Liouvillian gap (the inverse relaxation time) by exploiting the integrability of the systems.

[1] Naoyuki Shibata and Hosho Katsura, Phys. Rev. B **99**, 174303 (2019).
[2] Naoyuki Shibata and Hosho Katsura, Phys. Rev. B **99**, 224432 (2019).

連絡教員　物理学系　笹本　智弘（内線 2736）