Dynamics of coupled quantum systems

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Stellingen

Behorende bij het proefschrift

Dynamics of Coupled Quantum Systems

1. The correlations between two systems, built through an instantaneous quench and as captured by the von Neumann entropy, can be measured through the post-quench energies of the systems.
[*Chapter 2*]

2. Although the energy of the hotter system can rise shortly after the quench, its temperature does not increase, and there is no heat transport from the colder to the hotter system.
[*Chapter 3*]

3. When quench-coupling two initially thermal Mixed Field Ising systems a transition temperature exists. If the initial temperature of the hotter system is higher than the transition temperature, its post-quench energy does not increase.
[*Chapter 4*]

4. Quench-induced discharging of a fermionic Sachdev-Ye-Kitaev model quantum dot reveals characteristics of the non-Fermi liquid state.
[*Chapter 5*]

5. The von Neumann entropy encodes both classical and quantum correlations.
[*Chapter 3*]

6. The Sachdev-Ye-Kitaev model should be considered a theoretical system rather than a natural phenomenon.
[arXiv:1506.05111]

7. The large N disorder-averaged Sachdev-Ye-Kitaev model can also be obtained even if the couplings are drawn from other zero-mean distributions.
[*arXiv:1604.07818*]

8. The von Neumann entropy of scar eigenstates is considerably lower compared to the von Neumann entropy of eigenstates with similar energy. Relative entropy links this phenomenon to the non-thermalization dynamics of scar states.
[arXiv:2106.10300]

9. Valuing scientific quantity over quality creates a discouraging academic environment, especially for aspiring researchers.

10. The unchecked pollution of the natural environment and global warming are the greatest existential challenges for humankind, and we must take them seriously.

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Leiden, 07$^{\text{th}}$ februari 2024