**Week 10**

After last week’s results, I am finding that the interesting thing about this system is how entanglement and corelations propagate through the system after a quench. This lead me to a few papers looking at quasiparticle like propagation in Isling chains and the Lieb-Robinson bound.

A purple and orange squares

Description automatically generated with medium confidenceTo begin investigating entanglement propagation after a local quench I made a colormap plot of each of the individual atoms von Nuemenn Entropies. For a seven-atom system there is some sort of entanglement propagating through the system.

The growth of entanglement in a quantum many-body system can tell us a lot about thew system itself.

Volume vs Area Law

The big question is weather accessible local measurements display thermalisation.

Helpful resource: https://en.wikipedia.org/wiki/Many-body\_localization

Interesting ideas:

“Understanding the evolution towards thermal equilibrium of an isolated quantum system is at the foundation of statistical mechanics and a subject of interest in such diverse areas as cold atom physics or the quantum mechanics of black holes. Since a pure state can never evolve into a thermal density matrix, the Eigenstate Thermalization Hypothesis (ETH) has been put forward by Deutsch and Srednicki as a way to explain this apparent thermalization, similarly to what the ergodic theorem does in classical mechanics.”