



Contribution ID: 49    Type: 5th week (Formal developments and other frontiers in lattice QCD)

## Dynamics of different field theory models and applications

*Thursday, November 14, 2024 10:00 AM (1 hour)*

We demonstrate the steps to study the dynamics of a field theory model using a digital computer, with an example of the SYK model. We present calculations on IBM's superconducting quantum computer and state-of-the-art results using various error mitigation techniques. Specifically, we compute the vacuum return probability and out-of-time-order correlators (OTOC) at different times, standard observables for quantifying the chaotic nature of quantum systems.

Next, we consider the two-flavor Gross-Neveu model and compute the real-time evolution of probabilities relevant to the scattering phase shift calculation with a digital quantum computer. We outline the steps for preparing the ground state, generating a Gaussian wave packet, and performing a Quantum Fourier Transform on the quantum device. The phase shift is determined from the time delays measured from normalized probabilities with and without inter-flavor interaction.

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**Session Classification:** 1-day workshop (5th week)