My Abstract for Obergurgl 2022

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Current noisy intermediate-scale quantum (NISQ) devices are not only interesting as digital quantum processors, but also constitute powerful platforms for analog quantum simulation. While it is well known that the static Hamiltonian of a quantum computer offers opportunities for simulation, the possibility to implement arbitrary drives on each site of the lattice in fact promise an enormous freedom to engineer many-body models. In a first part, I will show experimental results from quasiperiodic driving of a single qubit, which allows us to observe a temporal version of the half-Bernevig-Hughes-Zhang Chern insulator [1]. Using simple error mitigation, we achieve consistently high fidelities of around 97%. I will then present promising preliminary results on the many-body case and give an outlook on promises and limitations of analogue simulation of driven many-body systems on quantum computers.

References

[1] D Malz, A Smith; Physical Review Letters **126** (16), 163602 (2021)

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