

Name: Andreas Hartmann

Title: Efficient local counter-diabatic driving in adiabatic quantum computing

Abstract: We present a coherent counter-diabatic quantum protocol to prepare ground states in general Ising spin glasses with considerably enhanced final ground state fidelity compared to a quantum annealing protocol. We make use of a variational method to find approximate counter-diabatic Hamiltonians that has recently been introduced by Sels and Polkovnikov [Proc. Natl. Acad. Sci. **114**, 3909 (2017)] and develop further the latter method. The resulting additional terms in our protocol are time-dependent local on-site y -magnetic fields. The protocol consists only of local and nearest-neighbor terms which makes it attractive for implementations in near term experiments.