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Speeding up quantum annealing: schedule engineering and optimal driving

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Shortcuts to adiabaticity in adiabatic quantum computation can be realized either by optimal designs of the annealing schedules or by using external control fields, such as counterdiabatic (CD) driving operators. I will discuss how genetic algorithms can help in determining optimal annealing schedules. Secondly, I will introduce the variational approach to CD driving in closed quantum systems to build approximate CD operators, satisfying locality constraints. Finally, I will discuss a generalization of the variational approach to open quantum systems.

1. P. R. Hegde, GP, A. Scocco, P. Lucignano, arXiv:2108.03185 (2021)

2. GP, V. Cataudella, R. Fazio, P. Lucignano, PRResearch 2, 013283 (2020)

3. GP, R. Fazio, P. Lucignano, arXiv:2109.13043 (2021)

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