

Quantum Reinforcement Learning in the presence of Thermal Dissipation.

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A study of the effect of thermal dissipation on quantum reinforcement learning is performed. For this purpose, a nondissipative quantum reinforcement learning protocol is adapted to the presence of thermal dissipation. Analytical calculations as well as numerical simulations are carried out, obtaining evidence that dissipation does not significantly degrade the performance of the quantum reinforcement learning protocol for sufficiently low temperatures, in some cases even being beneficial. Quantum reinforcement learning under realistic experimental conditions of thermal dissipation opens an avenue for the realization of quantum agents to be able to interact with a changing environment, as well as adapt to it, with many plausible applications inside quantum technologies and machine learning [1-2].

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