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Open quantum systems and matrix product operators

Nonequilibrium physics of many-body systems can be studied in different ways, for instance, evolving a nonstationary state in time, or by looking at a nonequilibrium steady state reached in the presence of an explicit driving. Regardless of whether one tries to study it analytically or numerically one has to face a huge complexity of many-body systems. One way to tame the problem is by using open systems setting as described by Lindblad master equation. I will explain the basics of the setting, mention some exceptional cases where exact solutions are possible, as well as outline numerical simulations using matrix product operators.