Strongly correlated nonequilibrium steady states with currents — classical and quantum picture

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In my talk I will introduce several explicit models of strongly correlated stationary states of conservative systems in one dimension that are driven out of equilibrium with the dissipative couplings at the system boundaries. All these models share a simple algebraic matrix product structure of the exact solution. In the framework of quantum physics, the main examples of such models are integrable spin chains, e.g. the XXZ model, or Fermi-Hubbard model, while in the realm of classical physics we have an example of a reversible and integrable cellular automaton. I will outline general features of solving nonequilibrium stationary states in terms of matrix product ansatz and its generalizations and stress some of the most interesting and outstanding open problems.