Tilted 1D Bose gases and atomtronics

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After an introduction to atomtronics and 1D ultracold gases, I discuss how to implement an integrable Floquet Hamiltonian for a periodically tilted 1D Bose gas. In general, an integrable model subjected to a periodic driving gives rise to a non-integrable Floquet Hamiltonian. Here we show that the Floquet Hamiltonian of the integrable Lieb-Liniger model in presence of a linear potential with a periodic time-dependent strength is instead integrable and its quasi-energies can be determined using the Bethe ansatz approach. To conclude, a discussion of the applications to atomtronics is presented.