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*Floquet resonances from integrability in driven Richardson-Gaudin models*

Adiabatically varying the driving frequency of a periodically-driven many-body quantum system can induce controlled transitions between resonant eigenstates of the time-averaged Hamiltonian, corresponding to adiabatic transitions in the Floquet spectrum and presenting a general tool in quantum many-body control.

While it is generally impossible to obtain the exact Floquet Hamiltonian in driven interacting systems, we exploit Richardson-Gaudin integrability to show how techniques from quantum quenches can be used to explicitly construct the Floquet Hamiltonian in a restricted many-body basis of Bethe states and model the resulting Floquet resonances. Using the central spin model as an application, we show how such controlled driving processes can lead to a polarization-based decoupling of the central spin from its decoherence-inducing environment at resonance.