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Work Distributions far from Equilibrium in Quantum Spin
Chaines

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— We are investigating the non equilibrium steady state for different quantum spin
chaines by an exact numerical calculation. The systems, initially in a canonical state,
are driven out of equilibrium by a periodic external force which couples to each site.
Motivated by the Jarzynski relation and the fluctuation theorem for quantum sys-
tems we analyze in detail the probability distribution P(W). Both finite and infinite
temperatures are discussed. General properties independent of the nature of the
interaction are identified and we observe two dynamic regimes in the limit of small
and large frequencies. The intermediate regime is characterized by resonance peaks
in the distribution. The moments of the distribution can be exploited to discuss the
possible definitions of a Jarzynski-operator for quantum systems.

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