

Quantum quenches in the sine-Gordon model: A semiclassical approach

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There are still many unanswered questions about the stationary state of closed many-body quantum systems after they are taken out of equilibrium. Even less is known about the details of the time evolution and the time scales of the relaxation, and analytic results are notoriously hard to obtain. I report the computation of the time evolution of correlation functions after quantum quenches in the sine–Gordon model within the semiclassical approximation which is expected to yield accurate results for small quenches. We demonstrate this by reproducing results of a recent form factor calculation for the relaxation of expectation values. Extending these results, we find that the expectation values of most vertex operators do not decay to zero. Analytic expressions are given for the relaxation of dynamic correlation functions, and we show that they have diffusive behavior for large timelike separation.

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