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Non-equilibrium dynamics in 1+1 dimensional interacting scalar quantum field theory*

Monday 30 May 2022 14:00 (1 hour)

We develop a truncated Hamiltonian method to investigate the dynamics of the 1 +1-dimensional ϕ^4 theory following quantum quenches. The results are compared to two different semiclassical approaches, the self-consistent Gaussian approximation and the truncated Wigner approximation, and used to determine the range of validity of these widely used approaches. We then use this method to investigate the decay by realising it as a quantum quench, and show that in the thin wall limit the theoretical prediction is well reproduced for several values of the coupling in a range of the value of the latent heat, apart from a normalisation factor which only depends on the strength of self-interactions.

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