

Quantum quench in interacting field theory: a self-consistent approximation

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(Submitted on 1 Feb 2010)

We study a composite quantum quench of the energy gap and the interactions in the non-integrable ϕ^4 model using a self-consistent approximation. Firstly we review the results for free theories where a quantum quench of the energy gap or mass leads for long times to stationary behaviour with thermal characteristics. An exception to this rule is the 2d case with zero mass after the quench. In the composite quench however we find that the effect of the interactions in our approximation is simply to effectively change the value of the mass. This means on the one hand that the interacting model also exhibits the same stationary behaviour and on the other hand that this is now true even for the massless 2d case.

Comments: 19 pages, 15 figures

Subjects: **Quantum Physics (quant-ph)**; Statistical Mechanics (cond-mat.stat-mech); High Energy Physics - Theory (hep-th)

Cite as: [arXiv:1002.0167v1](#) [quant-ph]

Submission history

From: Spyros Sotiriadis [[view email](#)]

[v1] Mon, 1 Feb 2010 02:02:02 GMT (891kb)

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