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Departamentos de Física Teórica I y II
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TITULO: Testing universality of topological defect formation: an update

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ABSTRACT

In the course of a non-equilibrium continuous phase transition, the dynamics ceases to be adiabatic in the vicinity of the critical point as a result of the critical slowing down (the divergence of the relaxation time in the neighborhood of the critical point). This enforces a local choice of the broken symmetry and can lead to the formation of topological defects. The Kibble-Zurek mechanism (KZM) was developed to describe the associated nonequilibrium dynamics and to estimate the density of defects as a function of the quench rate through the transition. During recent years, several new experiments investigating formation of defects in phase transitions induced by a quench both in classical and quantum mechanical systems were carried out. At the same time, some established results were called into question. We review and analyze the Kibble-Zurek mechanism focusing in particular on this surge of activity, and suggest possible directions for further progress.

Bibliography:

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