Instantons in far-from-equilibrium spinor gases

Philipp Heinen[1,3], Aleksandr N. Mikheev[1,2,3], Christian M. Schmied[1,3], Ido Siovitz[1,3], and Thomas Gasenzer[1,2,3]

[1]*Kirchhoff-Institute for Physics, Heidelberg University, Im Neuenheimer Feld 227, 69120 Heidelberg, Germany*
[2]*Institute for Theoretical Physics, Heidelberg University, Philosophenweg 16, 69120 Heidelberg, Germany*
[3]*ExtreMe Matter Institute EMMI, GSI Helmholtzzentrum für Schwerionenforschung, Planckstr. 1, 64291 Darmstadt, Germany*

Non-linear excitations such as solitons or vortices play a key role in the far-from-equilibrium dynamics of coherent quantum many-body systems after a quench. Here we present an approach to study instanton-type excitations in ultracold spinor gases and characterise their universal signatures in time evolving correlation functions. In general, quenched or continuously driven quantum systems can show universal dynamics such as near non-thermal fixed points, generically in the form of scaling behaviour in space and time [1-3]. We discuss ways to classify instanton ensembles within this scheme using quantum field theoretical methods.

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