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**Disorder effects on quantum quenches in cold-atom systems** CHRISTOPHER HOOLEY, SUPA, University of St Andrews, UK, MAXIMILIAN SCHULZ, SUPA, University of St Andrews, UK and Max-Planck-Institut für Physik komplexer Systeme, Germany, RODERICH MOESSNER, Max-Planck-Institut für Physik komplexer Systeme, Germany — We present a combined computational and theoretical study of the dynamics of cold gases of fermionic atoms after a sudden change of the Hamiltonian (a "quantum quench"). In our proposed experiment, the pre-quench potential consists of an optical lattice, a harmonic trap, and uncorrelated site disorder (produced, for example, by exposing the atoms to laser speckle). The post-quench potential is the same, but with the centre of the harmonic trap shifted to one side. In the non-interacting case, we present results for the post-quench evolution of the density profile as the following parameters are varied: the pre-quench chemical potential; the disorder strength; and the distance over which the harmonic trap is displaced. We analyse these results in terms of the population of eigenstates of the post-quench Hamiltonian, as well as in terms of an effective model consisting of an open quantum system with a small number of degrees of freedom. Preliminary approaches to the inclusion of interatomic interaction effects are also discussed.

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