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Decoherence and Thermalisation dynamics in many-body systems[1] DEREK LEE, Imperial College London, UK, SAM GENWAY, University of Nottingham, UK, ANDREW HO, Royal Holloway University of London, UK — An isolated quantum system prepared in a pure state will evolve coherently in time. However, local observables of the system can appear thermalised in the sense that the reduced density matrix of a small part of the system approaches the form expected from a thermal Gibbs distribution. This eigenstate thermalisation hypothesis has been demonstrated numerically. We explore the dynamics of how the system approaches this thermalised state. Our previous numerical work on the Hubbard model [Phys. Rev. Lett. 105, 260402 (2010)] has found two dynamical regimes with exponential and Gaussian decay towards the thermal state respectively. We discuss how this can be understood analytically in a generic theory. We will explore the impact of symmetry laws on the dynamics.

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