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Quantum amplification in the presence of decoherence JAE-SEUNG LEE, ANATOLY KHITRIN, Department of Chemistry, Kent State University, Kent, Ohio, 44242-0001 — A one-dimensional Ising chain irradiated by weak resonant transverse field is a simple analytically solvable model of quantum amplification [Phys. Rev. A **71**, 062338 (2005)]. Operation of any practical device would be affected by decoherence. Here we present the results of the effect of decoherence on amplification dynamics. The dynamics of a 100-spin chain perturbed by random phase kicks of individual spins has been studied numerically. Time evolution of the total polarization is monitored for different strengths of decoherence. It is shown that decoherence decreases the maximum coefficient of amplification in this model. In the limit of strong decoherence, quantum dynamics resembles classical diffusion.

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