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Heterogeneous slow dynamics in a two dimensional doped classical antiferromagnet MALCOLM KENNETT, University of Cambridge, CLAUDIO CHAMON, Boston University, LETICIA CUGLIANDOLO, Ecole Normale Superieure — We introduce a lattice model for a classical doped two dimensional antiferromagnet which has no quenched disorder, yet displays slow dynamics similar to those observed in supercooled liquids. We calculate two-time spatial and spin correlations via Monte Carlo simulations and find that for sufficiently low temperatures, there is anomalous diffusion and stretched-exponential relaxation of spin correlations. The relaxation times associated with spin correlations and diffusion both diverge at low temperatures in a sub-Arrhenius fashion if the fit is done over a large temperature-window or an Arrhenius fashion if only low temperatures are considered. We find evidence of spatially heterogeneous dynamics, in which vacancies created by changes in occupation facilitate spin flips on neighbouring sites. We find violations of the Stokes-Einstein relation and Debye-Stokes-Einstein relation and show that the probability distributions of local spatial correlations indicate fast and slow populations of sites, and local spin correlations indicate a wide distribution of relaxation times, similar to observations in other glassy systems with and without quenched disorder.

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