

ABSTRACT. In this paper, the author investigates the scaling limit of a partial difference equation on the d dimensional integer lattice \mathbf{Z}^d , corresponding to a translation invariant random walk perturbed by a random vector field. In the case when the translation invariant walk scales to a Cauchy process he proves convergence to an effective equation on \mathbf{R}^d . The effective equation corresponds to a Cauchy process perturbed by a constant vector field. In the case when the translation invariant walk scales to Brownian motion he shows that the scaling limit, if it exists, depends on dimension. For $d = 1, 2$ he provides evidence that the scaling limit cannot be diffusion.