STOCHASTIC HOMOGENIZATION OF FRONT PROPAGATION PROBLEM

WITH UNBOUNDED VELOCITY

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Abstract We study the homogenization of first order Hamilton-Jacobi equations arising in front propagation problems in stationary ergodic media. In contrast with previous results, we do not assume the velocity of the front to be bounded. We show in this context that there is homogenization, the main difference with the classical setting is that an initial boundary layer might develop. We also prove that this is not the case when the medium is "i.i.d." in a suitable sense.

AMS Classifications: 82D30, 60K35, 93E20, 49L25 .
Keywords: front propagation, unbounded Hamiltonian, metric problem, minimal time function, reachable set, homogenization in random domain, i.i.d. domain, percolation theory, optimal control, viscosity solution.

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