A Martingale Approach to Homogenization of Unbounded Random Flows

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Abbreviated Title: Homogenization of Unbounded Random Flows

Abstract

We study the asymptotic behavior of $d-$dimensional Brownian Motion in unbounded incompressible random flows. We strengthen previous results (Oelschläger (1988), Fannjiang and Papanicolaou (1995)) and simplify the proof of the invariance principle in the sense of almost sure convergence in law by means of the martingale method. The key estimate is obtained by the PDE method called Moser's iterative scheme.

[1]American Mathematical Society 1991 subject classifications. Primary 60F17, 35B27; secondary 60G44.

[2]Key words and phrases: invariance principle, homogenization, martingale.