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Asymptotic decomposition of solutions to parabolic equations with a random microstructure.

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We consider a Cauchy problem for a divergence form second order parabolic operator with rapidly oscillating coefficients that are periodic in spatial variables and random stationary ergodic in time. It is known that in this case the homogenized operator is deterministic.

We obtain the leading terms of the asymptotic expansion of the solution, these terms being deterministic functions, and show that a properly renormalized difference between the solution and the said leading terms converges to a solution of some SPDE.

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