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Large Time Behavior of Randomly Perturbed Dynamical Systems.

We will discuss several asymptotic problems for randomly perturbed flows. One class of flows (with regions where a strong flow creates a trapping mechanism) leads to a new class of boundary value problems with non-standard boundary conditions. The same problems appear as a limiting object when studying the asymptotic behavior of diffusion processes with pockets of large diffusivity.

We will also discuss how large-deviation techniques can be used to study the asymptotic behavior of solutions to quasi-linear parabolic equations with a small parameter at the second order term and the long time behavior of the corresponding diffusion processes. (Received July 16, 2019)