

Preface

These notes are based on a graduate course on large deviations given at the Courant Institute in 2012. While a version of these notes appeared on the web at that time, it took considerable time for me to prepare a revision. The lectures focused on three sets of examples as do these notes:

- diffusions with small noise and the exit problem,
- large time behavior of Markov processes and their connection to the Feynman-Kac formula and the related large-deviation behavior of the number of distinct sites visited by a random walk,
- interacting particle systems, their scaling limits, and large deviations from their expected limits.

We will look at simple exclusion processes in d dimensions. Some of the material is quite intricate and towards the end instead of providing complete proofs, we will give the ideas behind the proofs and provide references.

I want to thank the students who attended the course and motivated me to write these notes. It took much longer than I expected for me to finish the revision and I want to thank the AMS for waiting patiently. I want to thank Ina Mette, whose regular but gentle reminders prevented the delay from being even longer.