

# STOCHASTIC STABILITY OF MARKOV PROCESSES

NIKOLA SANDRIĆ

*Faculty of Civil Engineering, University of Zagreb*

One of the classical directions in the analysis of Markov processes is studying their long-time behavior, the so-called stochastic stability. Stochastically stable Markov process naturally appear as mathematical models of many phenomena arising in nature and engineering, such as problems related to population dynamics, turbulent fluid flows and homogenization of heterogeneous structures. The goal of this exposition is to motivate and gradually introduce the notion of stochastic stability, first by discussing the most simple probabilistic models (random walks and Lévy process), then classical diffusion processes and finally diffusion processes with jumps.

Jedan od klasičnih smjerova u analizi Markovljevih procesa je proučavanje njihovog dugoročnog ponašanja, tzv. stohastičke stabilnosti. Stohastički stabilni Markovljevi procesi prirodno se nameću kao matematički modeli niza fenomena koji se pojavljuju u prirodi i inženjerstvu, poput problema vezanih za dinamiku populacija, opisivanja ponašanja toka turbulentnih fluida i homogenizacije heterogenih struktura. Cilj ovog izlaganja je motivirati i postepeno uvesti pojam stohastičke stabilnosti, prvo diskutirajući najjednostavnije vjerojatnosne modele (slučajne šetnje i Lévyeve procese), zatim klasične procese difuzija i konačno procese difuzija sa skokovima.