Oberseminar Mathematische Stochastik

Mittwoch, 6. Juni 2018, **17:00 Uhr, SRZ 205**

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Persistence of one-dimensional AR(1)-sequences

Abstract:
Motivated by previous work of Aurzada, Mukherjee and Zeitouni on persistence exponents of Markov chains and in particular autoregressive processes we consider the tail behaviour of the stopping time $T_0 = \min\{n \geq 1 : X_n \leq 0\}$ for a class of one-dimensional autoregressive processes (X_n). We discuss existing general analytic/probabilistic approaches to this and related problems and propose a new one, which is based on a renewal-type decomposition for the moment generating function of T_0 and on the analytic Fredholm alternative. Using this method, we show that $P_x(T_0 = n) \sim V(x)R_0^n$ for some $0 < R_0 < 1$. Furthermore we are able to prove convergence towards quasistationarity in our situation.
(Joint work with G. Hinrichs and V. Wachtel)