Lyapunov Exponents and Chaotic Behavior for Random Dynamical Systems in a Banach Space

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Abstract: We study the Lyapunov exponents and their associated invariant subspaces for infinite dimensional random dynamical systems in a Banach space, which are generated by, for example, stochastic or random partial differential equations. We prove a multiplicative ergodic theorem. We also prove that for an infinite dimensional random dynamical system with a random invariant set such as random attractor, if its topological entropy is positive, then the dynamics on the random invariant set is chaotic. This is based on joint works with Wen Huang and Zeng Lian.