Toward a smooth ergodic theory for infinite dimensional systems

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Abstract

Focusing on settings that are consistent with semi-flows defined by dissipative parabolic PDEs, I will discuss some first steps toward building a dynamical systems theory, in particular a theory of chaotic systems, for maps and semi-flows in Hilbert and Banach spaces. I will survey known results and present recent progress, including theorems on Lyapunov exponents, periodic solutions and horseshoes, entropy formula and SRB measures, and a notion of "almost every" initial condition that is natural to the underlying dynamics. Technical differences between finite and infinite dimensions will also be discussed.

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