


复旦大学数学科学学院
数学综合报告会

报告题目：**Ergodicity of Random Periodic Processes and Periodic Measures**

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报告地点：光华东主楼 1801

摘要：An ergodic theorem and a mean ergodic theorem in the random periodic regime on a Polish space are proved. In the Markovian random dynamical systems case, the idea of Poincare sections is introduced and under ergodic assumption of the discrete time semigroup at multiple integrals of the period, the ergodicity of the periodic measure is obtained. The distinction between random periodic and stationary regimes is characterised by the spectral structure of the infinitesimal generators of the Markov semigroups. It is asserted that infinitesimal generator has only multiples of the quotient of 2pi and the minimum period as its simple eigenvalues on the imaginary axis if and only if the minimum period of the periodic measure is positive. The generator has only one simple eigenvalue 0 on the imaginary axis if and only if it is in the mixing stationary case. The latter agrees with what the classical Koopman-von Neumann theorem suggests. We also prove that the spectral gap of the semigroup on Poincare sections gives the exponential convergence of the mean of transition probability to the mean of the periodic measure over one period and therefore the periodic measure is ergodic. This is a joint work with Chunrong Feng.

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