

Furstenberg type theorem for a multiplicative product of Markov random matrices

Nursadyk AKANBAY ¹

¹ *Department of Mechanics and Mathematics, Al-Farabi Kazakh National University, Almaty, Kazakhstan*
E-mail: noureke@mail.ru

Abstract: In the work, considering the certain conditions of "general situation", Furstenberg type theorem is proved for multiplicative product of a special type of Markov random matrices.

The classical theorem of Furstenberg of strict positivity of the largest Lyapunov exponent for the product of a large number of independent matrices and its generalization to the case of the dependent (for example, forming a Markov chain) random matrices play a key role in the whole range of issues related to the spectral properties of disordered structures.

Currently, there are several different approaches to proof theorems of Furstenberg [1], [2], [3]. In this paper we prove the the Furstenberg type theorem for multiplicative product (in terms of [4] multiplicative integral) Markov random matrices of a special form.

Note that, the necessity of studying of such multiplicative products of random matrices arise in the problems of the evolution of the magnetic field in so-called Markov linear incompressible flows [5].

Keywords: random matrix, a multiplicative product, transition function, transition density, the formula of Kac-Feynman, the Lyapunov exponent

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