ON FURSTENBERG THEOREM WITH A PARAMETER

VICTOR KLEPTSYN

It is known (and is the simplest case of a famous theorem by Furstenberg) that for a random product $B_n = A_n A_{n-1} \cdots A_2 A_1$ of matrices in $SL(2, R)$, its norm almost surely grows exponentially under some very mild assumptions on the law of A_is.

But what happens if these matrices depend on an additional parameter, that is, we are multiplying $A_i(s)$, thus getting products $B_n(s)$? For any fixed individual s, the Furstenberg theorem still is applicable. However, it turns out that under some (non-hyperbolicity-type) assumptions almost surely there is a small (random) set of parameters X, such that for any s from X the lower limit in the definition of the Lyapunov exponent $\liminf 1/n \log \|B_n(s)\|$ vanishes(!)