On the ergodicity of cylindrical transformations given by the logarithm.


Given $\alpha \in [0, 1]$ and a measurable function $\varphi : T \to \mathbb{R}$, the cylindrical cascade is a map from $T \times \mathbb{R}$ to itself given by

$$S_{\alpha, \varphi}(x, y) = (x + \alpha, y + \varphi(x)).$$

In the present paper it is proved that for a set of full Lebesgue measure of $\alpha \in [0, 1]$, the cylindrical cascade $S_{\alpha, \varphi}$ is ergodic for every smooth function $\varphi$ with a logarithmic singularity provided that the average of $\varphi$ vanishes.

Special flows constructed above $R_\alpha$ and under $\varphi + c$, where $c \in \mathbb{R}$ is such that $\varphi + c > 0$, are closely related to $S_{\alpha, \varphi}$. For functions $\alpha$ with an asymmetric logarithmic singularity the above result provides the first examples of ergodic cascades $S_{\alpha, \varphi}$ with the corresponding special flows being mixing.

The paper contains a good introduction to the subject and a substantial list of references.

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References


12. M. Herman, Unpublished manuscript.


Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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