

Bifurcations of invariant measures in discrete-time parameter dependent cocycles

Anastasia Maltseva, Volker Reitmann

Saint-Petersburg State University, Department of Mathematics and Mechanics, Russia

maltseva.anastacia@gmail.com, vreitmann@aol.com

Suppose that (Q, \mathfrak{A}, μ) is a probability space, $\{\tau^t\}_{t \in \mathbb{Z}}$ is a group of measurable maps $\tau^t(\cdot): Q \rightarrow Q$, which is called base flow ([1], [2]). Suppose also that (M, \mathfrak{B}, ν) is another measurable space for which a parameter dependent cocycle over the base flow is given by a semigroup of measurable with respect to the sigma-algebra $\mathfrak{A} \times \mathfrak{B}$ maps $\varphi_\alpha^t(\cdot, \cdot): Q \times M \rightarrow M$ where $t \in \mathbb{Z}_+$, and $\alpha \in \Lambda$ is a parameter from a metric space $\{\Lambda, \rho\}$. We investigate the existence and bifurcations of invariant measures for the skew product flow generated by $\{\varphi_\alpha, \tau\}$ using parameter dependent Perron-Frobenius operators on rigged Hilbert spaces.

As an example we consider the long term behavior of nonautonomous difference equations which describe cardiac alternans rhythms.

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References

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