Dynamics of induced mappings on symmetric products

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Let X be a metric continuum and $n \in \mathbb{N}$. Let $F_n(X)$ be the hyperspace of nonempty subsets of X with at most n points. If $1 \leq m < n$, we consider the quotient space $F_m^n(X) = Fn(X)/Fm(X)$. Given a map $f : X \to X$, we consider the induced maps

$$f_n : F_n(X) \to F_n(X)$$

and

$$f_m^n : F_m^n(X) \to F_m^n(X)$$

In this talk we study relations among the dynamics of the maps f, f_n and f_m^n and we answer some questions posed by F. Barragán, A. Santiago-Santos and J. Tenorio, related to the properties: minimality, irreducibility, strong transitivity and turbulence.

References

[1] J. Auslander, Minimal Flows and their Extensions, North-Holland Math. Studies, Vol. 153. North-Holland, Amsterdam, 1988.

[2] F. Barragán, S. Macías and A. Rojas, Conceptions of topological transitivity and sym- metric products, Turkish J. Math. 44, no. 2 (2020), 491–523.

[3] F. Barragán, S. Macías and A. Rojas, Conceptions of topological transitivity on sym- metric products, Math. Pannon. (N.S.) 27 (2021), 61–80.

[4] F. Barragán, A. Santiago-Santos and J. Tenorio, Dynamic properties for the induced maps on n-fold symmetric product suspensions, Glas. Mat. Ser. 51 (71) (2016), 453– 474.

[5] F. Barragán, A. Santiago-Santos and J. Tenorio, Dynamic properties for the induced maps on n-fold symmetric product suspensions II, Topology Appl. 288 (2021), 107484.

[6] F. Barragń, A. Santiago-Santos and J. Tenorio, Dynamic properties of the dynamical system (SFnm(X),SFnm(f)), Appl. Gen. Topol. 21, no. 1 (2020), 17–34.

[7] L. S. Block and W. A. Coppel, Stratification of continuous maps on an interval, Trans. Amer. Math. Soc. 297, no. 2 (1986), 587–604.

[8] J. Dugundji, Topology, Allyn and Bacon, Inc. 1966.

[9] J. L. Gḿez-Rueda, A. Illanes and H. Méndez-Lango, Dynamic properties for the in- duced maps in the symmetric products, Chaos Solitons Fractals 45, no. 9-10 (2012), 1180–1187.

[10] G. Higuera and A. Illanes, Induced mappings on symmetric products, Topology Proc. 37 (2011), 367–401.

[11] G. Higuera and A. Illanes, Fixed point property on symmetric products, Topology Appl. 159 (2012), 1–6.

[12] H. Hosokawa, Induced mappings between hyperspaces, Bull. Tokyo Gakugei Univ. 41 (1989), 1–6.

[13] A. Illanes and S. B. Nadler, Jr., Hyperspaces, Fundamentals and recent advances, Mono- graphs and Textbooks in Pure and Applied Math. Vol. 216, Marcel Dekker, Inc. New York and Basel, 1999.

[14] D. Kwietniak and M. Misiurewicz, Exact Devaney chaos and entropy, Qual. Theory Dyn. Syst. 6 (2005), 169–179.

[15] W. Parry, Symbolic dynamics and transformations of the unit interval, Trans. Amer. Math. Soc. 122 (1966), 368-378.

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