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Some notes on induced functions and group actions on hyperspaces. (English) Zbl 07506879

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Summary: Let $X$ be a topological space and $CL(X)$ be the family of all nonempty closed subsets of $X$. In this paper we discuss the problem of when a continuous map between topological spaces induces a continuous function between their respective hyperspaces. As a main result we characterize the continuity of the induced function in the case of the Fell and Attouch-Wets hyperspaces. Additionally we explore the problem of whether a continuous action of a topological group $G$ on a topological space $X$ induces a continuous action on $CL(X)$. In particular we give sufficient conditions on the topology of $G$ to guarantee that the induced action on $CL(X)$ is continuous, provided that $CL(X)$ is equipped with the Hausdorff or the Attouch-Wets metric topology.

MSC:

54B20 Hyperspaces in general topology
54C05 Continuous maps
54C35 Function spaces in general topology
54H15 Transformation groups and semigroups (topological aspects)
57S05 Topological properties of groups of homeomorphisms or diffeomorphisms

Keywords:
hyperspaces; Attouch-Wets metric; Fell topology; Vietoris topology; induced functions; group action; group topology

Full Text: DOI

References:


[26] Wang, Y.; Wei, G.; Campbell, W. H.; Bourquin, S., A framework of induced hyperspace dynamical systems equipped with the hit-or-miss topology, Chaos Solitons Fractals, 41, 4, 1708-1717 (2009)


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