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COINCIDENCE AND MAXIMAL TYPE RESULTS FOR SET VALUED MAPS

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Abstract. In this paper we present coincidence results in a general setting for a variety of set valued maps. Our argument relies on continuous selections and fixed point theory in the literature.

Keywords. Fixed and coincidence point theory, maximal elements.

AMS (MOS) subject classification: 47H10, 54H25

1 Introduction

In this paper we present a variety of new collectively coincidence point results for set valued maps. The class of maps considered include Kakutani maps, maps admissible with respect to Gorniewicz and set valued maps with continuous selections (see [1, 3, 4, 7, 8, 10] and the references therein). Using our new coincidence type theorems we establish some new maximal element type results for families of majorized type maps (see [12, 13, 14] and the references therein).

Now we describe the maps considered in this paper. Let H be the Čech homology functor with compact carriers and coefficients in the field of rational numbers K from the category of Hausdorff topological spaces and continuous maps to the category of graded vector spaces and linear maps of degree zero. Thus $H(X) = \{H_q(X)\}$ (here X is a Hausdorff topological space) is a graded vector space, $H_q(X)$ being the q–dimensional Čech homology group with compact carriers of X. For a continuous map $f : X \to X$, $H(f)$ is the induced linear map $f_\star = \{f_{\star\, q}\}$ where $f_{\star\, q} : H_q(X) \to H_q(X)$. A space X is acyclic if X is nonempty, $H_q(X) = 0$ for every $q \geq 1$, and $H_0(X) \approx K$.

Let X, Y and Γ be Hausdorff topological spaces. A continuous single valued map $p : \Gamma \to X$ is called a Vietoris map (written $p : \Gamma \Rightarrow X$) if the following two conditions are satisfied:
(i). for each $x \in X$, the set $p^{-1}(x)$ is acyclic
(ii). p is a perfect map i.e. p is closed and for every $x \in X$ the set $p^{-1}(x)$ is nonempty and compact.