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by

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CATEGORICAL PROPERTIES ON THE HYPERSPACE OF NONTRIVIAL CONVERGENT SEQUENCES

S. GARCÍA-FERREIRA, R. ROJAS-HERNÁNDEZ, AND Y. F. ORTIZ-CASTILLO

ABSTRACT. In this paper, we shall study categorial properties of the hyperspace of all nontrivial convergent sequences $\mathcal{S}_c(X)$ of a Fréchet-Urysohn space X equipped with the Vietoris topology. We mainly prove that $\mathcal{S}_c(X)$ is meager whenever X is a crowded space; as a corollary, we obtain that if $\mathcal{S}_c(X)$ is Baire, then X has a dense subset of isolated points. As an interesting example, $\mathcal{S}_c(\omega_1)$ has the Baire property, where ω_1 carries the order topology. (This answers a question from *The hyperspace of convergent sequences*, Topology Appl. **196** (2015), part B, 795–804.) We can give more examples like this one by proving that the Alexandroff duplicate $\mathcal{A}(Z)$ of a space Z satisfies that $\mathcal{S}_c(\mathcal{A}(Z))$ has the Baire property whenever Z is a Σ -product of completely metrizable spaces and Z is crowded. Also, we show that if $\mathcal{S}_c(X)$ is pseudocompact, then X has a relatively countably compact dense subset of isolated points, every finite power of X is pseudocompact, and every G_δ -point in X must be isolated. We also establish several topological properties of the hyperspace of nontrivial convergent sequences of countable Fréchet-Urysohn spaces with only one non-isolated point.

1. INTRODUCTION

All our spaces will be Tychonoff (completely regular and Hausdorff). The letters \mathbb{P} and \mathbb{N} will denote the irrational numbers and the natural numbers, respectively. The positive natural numbers will be denoted by

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Key words and phrases. Baire property, hyperspace, meager, nontrivial convergent sequence, Vietoris topology.

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