ON UNIFORMLY CONTINUOUS SURJECTIONS BETWEEN C_p-SPACES OVER METRIZABLE SPACES

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Abstract: Let X and Y be metrizable spaces and suppose that there exists a uniformly continuous surjection $T : C_p(X) \to C_p(Y)$ (resp., $T : C_p^*(X) \to C_p^*(Y)$), where $C_p(X)$ (resp., $C_p^*(X)$) denotes the space of all real-valued continuous (resp., continuous and bounded) functions on X endowed with the pointwise convergence topology.

We show that if additionally T is an inversely bounded mapping and X has some dimensional-like property $\mathcal{P}$, then so does Y. For example, this is true if $\mathcal{P}$ is one of the following properties: zero-dimensionality, countable-dimensionality or strong countable-dimensionality.

Also, we consider other properties $\mathcal{P}$: of being a scattered, or a strongly σ-scattered space, or being a Δ_1-space (see [3]). Our results strengthen and extend several results from [1], [2] and [3].

This is joint work with Ali Emre Eysen and Vesko Valov.

References

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