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Continuity Phenomenon of Kenderov and Porosity: the Case of Countable Systems

Kenderov [*Continuity-like properties of set-valued mappings*, Serdica Bulg. Math. Publ. 9 (1983) 149–160] proved a general result stating that an arbitrary multivalued mapping from a topological space X to a set Y has some properties resembling continuity at every point of a residual subset $X_0 \subset X$ (i.e. its complement $X \setminus X_0$ is of first Baire category). This statement has far-reaching consequences and can be called a "continuity phenomenon", since it proves and unifies in a general approach several different results in topology and functional analysis, mainly concerning single-valuedness almost everywhere (in the topological sense) of multivalued mappings. In this paper we show that, in the case when X is a metric space and Y is a compact separable topological space, the set X_0 is even σ-full cone porous (a notion introduced here). It implies that the above (and other) "generic" results have "σ-full cone porous" versions, with unified proofs.

Keywords: Porous sets, fully cone porous set, generalized monotone mapping, submonotone mapping, lower almost continuity.

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