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Counterparts of Smirnov's compacta for inductive functions $PtrInd$

In 1959 Smirnov constructed metrizable compacta S^α, $\alpha < \omega_1$, such that $trIndS^\alpha = \alpha$ for each α. Some years later Levshenko proved that $trInd\,X \le \omega_0 \cdot trind\,X$ for any metrizable compact space X. This result together with the inductive character of the function $trind$ implied for each $\alpha : 0 \le \alpha < \omega_1$, the existence of a compact metrizable space X_α such that $trind\,X_\alpha = \alpha \le trInd\,X_\alpha \ne \infty$.

We generalize Smirnov's construction. In particular, for each absolute multiplicative or additive Borel class P and each $\alpha < \omega_1$ we present a separable metrizable space S^α_P such that $PtrInd\,S^\alpha_P = trInd\,S^\alpha_P = \alpha$ and $QtrInd\,S^\alpha_P = -1$ for any other absolute multiplicative or additive Borel class Q containing P.

In 1997 Charalambous proved that for any separable metrizable space X with $trInd\,X \ne \infty$ and any absolute multiplicative or additive Borel class P the inequality $PtrInd\,X \le \omega_0 \cdot (Ptrind\,X + 1)$ holds.

These two results imply that for each absolute multiplicative or additive Borel class P and each $\alpha < \omega_1$ there exists a separable metrizable space X^α_P such that $Ptrind\,X^\alpha_P = \alpha \le trInd\,X^\alpha_P \ne \infty$ and $QtrInd\,S^\alpha_P = -1$ for any other absolute multiplicative or additive Borel class Q containing P.

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