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Borel complexity in hyperspaces up to equivalence

Joint work with Jozef Bobok, Pavel Pyrih, and Benjamin Vejnar

We say that two classes $\mathcal{C}$ and $\mathcal{D}$ of topological spaces are *equivalent* if every space in $\mathcal{C}$ is homeomorphic to a space in $\mathcal{D}$ and vice versa. For a class of metrizable compacta $\mathcal{C}$ we consider the collection of all families $\mathcal{F} \subseteq \mathcal{K}([0,1]^\omega)$ equivalent to $\mathcal{C}$, and we denote this collection by $[\mathcal{C}]$.

Usually, complexity of such class $\mathcal{C}$ means the complexity of the saturated family $\max([\mathcal{C}]) \subseteq \mathcal{K}([0,1]^\omega)$. There are many results of this type. We are rather interested in the lowest complexity among members of $[\mathcal{C}]$. This is rarely the complexity of the saturated family. We study this Borel complexity up to the equivalence because of its connection with our notion of *compactifiable classes*. We have shown [1] that every analytic family in $\mathcal{K}([0,1]^\omega)$ is equivalent to a G_δ family and that these correspond to *strongly Polishable classes*. Similarly, closed families correspond to *strongly compactifiable classes*. It is natural to ask about the other complexities – clopen, open, and F_σ

In the talk we give an overview of the theory and used notions, and we formulate our new results regarding open and F_σ classes.

[1] Bartoš, A., Bobok, J., Pyrih, P., Vejnar, B., Compactifiable classes of compacta. arXiv:1801.01826.