CLOSED HEREDITARY COREFLECTIVE SUBCATEGORIES IN CERTAIN CATEGORIES OF TOPOLOGICAL SPACES

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Denote by **Tych** (**ZD**) the category of all Tychonoff (zero-dimensional) spaces. Let **A** be an epireflective subcategory of the category **Top** of all topological spaces such that $\mathbf{ZD} \subseteq \mathbf{A} \subseteq \mathbf{Tych}$. Our goal is to describe closed hereditary coreflective subcategories of **A**.

Let α be a regular cardinal. By $\mathbf{Top}(\alpha)$ we denote the subcategory of **Top** consisting of such spaces X that if $\mathcal{U}$ is a non-empty family of open subsets of X with $|\mathcal{U}| < \alpha$, then the intersection $\bigcap_{U \in \mathcal{U}} U$ is open in X. The subcategories $\mathbf{Top}(\alpha) \cap \mathbf{A}$ are closed hereditary and coreflective in **A**.

Let $C(\alpha)$ be the space on the set $\alpha \cup \{\alpha\}$ such that a subset U is open in $C(\alpha)$ if and only if $\alpha \notin U$ or $|\alpha \setminus U| < \alpha$. In [1] we showed that if MA (Martin's Axiom) holds and measurable cardinals do not exist, then the closed hereditary coreflective hull of the space $C(\omega_0)$ in **A** is the whole category **A**.

In our talk we show that if MA holds and measurable cardinals do not exist, then the closed hereditary coreflective hull of the space $C(\alpha)$ in **A** is $\mathbf{Top}(\alpha) \cap \mathbf{A}$ for any regular cardinal α. We obtain that if **B** is a closed hereditary coreflective subcategory of **A** such that $\mathbf{B} \neq \mathbf{Top}(\alpha) \cap \mathbf{A}$ and $\mathbf{B} \neq \mathbf{Dis}$ (the category of all discrete spaces), then **B** consists only of sums of connected spaces. Hence, the only closed hereditary coreflective subcategories of **ZD** are **Dis** and $\mathbf{Top}(\alpha) \cap \mathbf{ZD}$, where α is a regular cardinal.

References

[1] Pitrová, V., *Closed hereditary coreflective subcategories in epireflective subcategories of Top*, Math. Slovaca **67** (2017) 83–88.

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