

Automorphisms of $\mathcal{P}(\lambda)/\mathcal{I}_\kappa$

Paul Larson, Paul McKenney*

larsonpb@miamioh.edu,
mckennp2@miamioh.edu

It has long been known that, consistently, there exists an automorphism of $\mathcal{P}(\mathbb{N})/fin$ which is not induced by a function $\mathbb{N} \rightarrow \mathbb{N}$. However, several questions about similar structures on uncountable cardinals remain open, for instance:

Question *Is it consistent with ZFC that there exists an automorphism of $\mathcal{P}(\omega_1)/ctble$ which is not induced by a function $\omega_1 \rightarrow \omega_1$?*

In this talk I study automorphisms of the Boolean algebra $\mathcal{P}(\lambda)/\mathcal{I}_\kappa$, where \mathcal{I}_κ denotes the ideal of sets with cardinality less than κ , for various choices of κ and λ . I will demonstrate several conditions that imply that such an automorphism is induced by a function from λ to λ . These results will reveal connections with several classic topics from set-theoretic topology, including Q-sets, ladder systems, and Turzanski's Problem (also known as the Katowice Problem), which asks:

Question *Is it consistent with ZFC that $\mathcal{P}(\mathbb{N})/fin$ and $\mathcal{P}(\omega_1)/fin$ are isomorphic?*

