David Chodounsky

The topological space consisting of free ultrafilters on a cardinal κ is denoted κ^*. It is not hard to prove that if $\kappa \neq \lambda$ and $\{\kappa, \lambda\} \neq \{\omega, \omega_1\}$ then κ^* and λ^* are not homeomorphic. The remaining case is still open. This problem can be also formulated in the language of Boolean algebras: Can $P(\omega)/Fin$ be homeomorphic to $P(\omega_1)/Fin$?

So far there are known only few non trivial consequences of existence of such homeomorphism. Namely $d = \omega_1$ and the existence of a strong Q-sequence of size ω_1 (also called uniformizable AD-system). Both of these facts are consistent with ZFC but it has not been shown yet, that they can be realized in the same model at once. (Update: A minor modification of a forcing notion from [4] provides such model.)

My aim is to use forcing methods to build models containing at least a partial approximation of such homeomorphism and also to build a model, where both conditions mentioned above are realized. During this process some other consequences of such homeomorphism may be discovered.

References

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