# Lifting homeomorphisms from separable quotients of $\omega^*$

*Stefan Geschke*, Tomás S. Salles*[1]

stefan.geschke@uni-hamburg.de,
salles@or.uni-bonn.de

In [1], the authors showed that every isomorphism of between two countable subalgebras of $\mathcal{P}(\omega)/\mathit{fin}$ extends to an automorphism of $\mathcal{P}(\omega)/\mathit{fin}$. Using Stone duality, this result can be viewed as a statement about homeomorphisms between zero-dimensional quotients of $\omega^*$. We generalize this to higher dimensional quotients.

**Theorem** *Let $X$ and $Y$ be compact metric spaces and let $f : \omega^* \to X$ and $g : \omega^* \to Y$ be continuous and onto. If $\varphi : X \to Y$ is a homeomorphism, then there is a homeomorphism $\overline{\varphi} : \omega^* \to \omega^*$ such that $\varphi \circ f = g \circ \overline{\varphi}$.*

The proof of this theorem uses the fact that every continuous map from $\omega^*$ to a metric space extends to a continuous map from $\beta\omega$ to the same metric space.

[1] A. Bella *et al.*, *Embeddings into $\mathcal{P}(\mathbb{N})/\mathit{fin}$ and extension of automorphisms*, Fund. Math. **174** (2002), no. 3, 271–284



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