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Compactifications of ω and the Banach space c_0

ABSTRACT. If $\gamma\omega$ is a compactification of ω then the space of continuous functions $C(\gamma\omega)$ contains a natural copy X of c_0, where

$$X = \{f \in C(\gamma\omega) : f|\gamma\omega \setminus \omega = 0\}.$$

We investigate for which $\gamma\omega$ the space X is complemented in $C(\gamma\omega)$. This is the case if $\gamma\omega$ is metrizable (Sobczyk's theorem); on the other hand, X is not complemented in $C(\beta\omega)$ by a theorem due to Phillips.

The fact that X is complemented in $C(\gamma\omega)$, where $\gamma\omega$ is zerodimensional can be expressed in terms of finitely additive measures on Boolean subalgebras of $P(\omega)/\mathit{fin}$. We present some examples of $\gamma\omega$ related to a problem if the complementability of c_0 in $C(\gamma\omega)$ can be decided by topological properties of the remainder $\gamma\omega \setminus \omega$.