

Behavior of functional countability in products

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A space X is called *functionally countable* if $f(X)$ is countable for any continuous function $f : X \rightarrow \mathbb{R}$. We will show that, given a functionally countable space X , if K is a scattered Corson compact space, then the product $X \times K$ is functionally countable. If the space X is, additionally, weakly ω_1 -Lindelöf, then $X \times L$ is functionally countable for any scattered Lindelöf space L . In particular, if X is a weakly Lindelöf functionally countable space, then the product $X \times L$ is functionally countable whenever L is a scattered Lindelöf space. We also establish that any finite product of countably compact functionally countable spaces is functionally countable. If the product $X = X_1 \times \dots \times X_n$ of functionally countable spaces X_1, \dots, X_n is pseudocompact, then X is functionally countable.