

Productively (and non-productively) Menger spaces

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A topological space is *Menger* if, for every sequence of open covers, we can produce a new cover by choosing finitely many open sets from each of the given covers. Menger's property is strictly stronger than being Lindelöf. Every σ -compact space is Menger, and even *productively* so: Every product of a σ -compact space and a Menger space is Menger.

Based on weak set theoretic hypotheses, we construct, in a purely combinatorial way, Menger sets of real numbers whose product is not Menger.

The *Hurewicz property* is a strong form of Menger's property. Using our method, we prove, assuming a portion of CH, that every productively Menger space is productively Hurewicz, and that the converse implication is not provable.

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