

The principle (*) of Sierpinski and non-meager sets
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The principle (*) of Sierpinski is the assertion that there is a family of functions $\{\varphi_n : \omega_1 \longrightarrow \omega_1 \mid n \in \omega\}$ such that for every $I \in [\omega_1]^{\omega_1}$ there is $n \in \omega$ such that $\varphi_n[I] = \omega_1$. We prove that this principle holds if there is a non-meager set of size ω_1 , answering question of Arnie Miller. Combining our result with a theorem of Miller it then follows that (*) is equivalent to $non(\mathcal{M}) = \omega_1$. Miller also proved that the principle of Sierpinski is equivalent to the existence of a weak version of a Luzin set, we will construct a model where all of this sets are meager yet $non(\mathcal{M}) = \omega_1$.