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Set Mappings on 4-tuples

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This talk is a report on a joint work of the author and Shelah. Our main objects of study here are set mappings which are functions of the type $f\colon [\lambda]^k \to [\lambda]^{<\mu}$ for some natural number $k \geq 1$ and cardinals λ, μ, which satisfy $f(\bar{x}) \cap \bar{x} = \emptyset$ for every $\bar{x} \in [\lambda]^k$. The motivation in this part of combinatorial set theory is to know how large free sets exist. A subset H of λ is called free if $f(\bar{x}) \cap H = \emptyset$ for every $\bar{x} \in [H]^k$. After reviewing some classical results of Kuratowski-Sierpinski, Erdös-Hajnal, Hajnal, Hajnal-Máté, we will focus on set mappings on 4-tuples. We continue a previous work of Komjath and Shelah (2000) by getting new finite bounds on the size of free sets in a generic extension. This is obtained by an entirely different forcing construction.