

DEFINABLE BISTATIONARY SETS

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ABSTRACT. The results presented in this talk are motivated by the question whether sets that are usually constructed using the Axiom of Choice can have simple definitions. In this talk, I want to focus on the definability of bystationary subsets of uncountable regular cardinals, i.e. stationary subsets whose complement is also stationary. We will start by presenting results that show that the right interpretation of the above question is to ask whether canonical extensions of the axioms of ZFC imply that for certain uncountable regular cardinals κ , no bystationary subset of κ is definable by a Σ_1 -formula that only uses κ and sets of hereditary cardinality less than κ as parameters. Next, I will present results that show that extensions of ZFC through large cardinal assumptions or forcing axioms imply that no bystationary subset of the first uncountable cardinal ω_1 is simply definable in this sense. Finally, I will present very recent work that can be used to establish equiconsistency results between the existence of infinitely measurable cardinals and the non-existence of very simply definable bystationary subsets of successors of singular cardinals.

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