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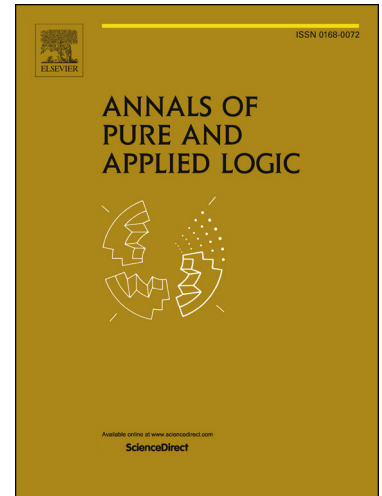
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**THE TREE PROPERTY AT DOUBLE SUCCESSORS OF SINGULAR
CARDINALS OF UNCOUNTABLE COFINALITY**

MOHAMMAD GOLSHANI AND RAHMAN MOHAMMADPOUR

ABSTRACT. Assuming the existence of a strong cardinal κ and a measurable cardinal above it, we force a generic extension in which κ is a singular strong limit cardinal of any given cofinality, and such that the tree property holds at κ^{++} .

1. INTRODUCTION

Infinite trees are of fundamental importance in modern set theory. In this paper, we are interested in κ -Aronszajn trees. Recall that a κ -tree T is called κ -Aronszajn, if it has no cofinal branches. The tree property at an infinite cardinal κ , denoted $TP(\kappa)$, is the assertion “there are no κ -Aronszajn trees”. There are various results concerning models of the tree property at one or infinitely many cardinals. One of these results that is of our interest in this paper, is a theorem of Cummings and Foreman [2], who produced - relative to the existence of a supercompact cardinal κ and a weakly compact cardinal above it - a model in which κ is a singular strong limit cardinal of countable cofinality, and the tree property holds at κ^{++} . They also stated the same result for the case $\kappa = \aleph_{\omega+2}$. Recently, Friedman and Halilović [4] obtained the same results, by employing a weaker large cardinal assumption. There are various generalizations of the above-mentioned results, see for example [3], [5], [6], and [7].

Our motivation for this paper is that all papers mentioned in the previous paragraph are merely covering singular cardinals of countable cofinality; and moreover, it is quite natural to ask if the same results can be proved for singular cardinals of uncountable cofinality. In this paper, we extend the above cited theorem of Cummings and Foreman to singular cardinals of uncountable cofinality.

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