1088-03-81 **Antonio Montalbán** and **Richard A. Shore*** (shore@math.cornell.edu), Department of Mathematics, Malott Hall, Cornell University, Ithaca, NY 14853. *The Limits of Determinacy in Second Order Arithmetic: Consistency and Complexity Strength.* Preliminary report.

We study the consistency and reverse mathematical strength of low levels of determinacy axioms. We derive our results by a recursion/complexity theoretic analysis.

Determinacy for all Boolean combinations of $F_{\sigma\delta}$ ($\mathbf{\Pi}^0_3$) sets implies the consistency of second-order arithmetic and more. Indeed, it is equivalent to the existence, for every set X and $n \in \mathbb{N}$, of a β-model of $\mathbf{\Pi}^1_n$-comprehension containing X. We prove this by providing a level-by-level analysis of determinacy at the finite level of the difference hierarchy on $\mathbf{\Pi}^0_3$ sets: For $n \geq 1$, determinacy at the nth level lies strictly between the existence of β-models of $\mathbf{\Pi}^1_{n+2}$-comprehension containing any given set X and of such models of $\mathbf{\Delta}^1_{n+2}$-comprehension. Thus it lies strictly between $\mathbf{\Pi}^1_{n+2}$-comprehension and $\mathbf{\Delta}^1_{n+2}$-comprehension in consistency strength. The major new technical result is a recursion/complexity theoretic one. The *nth* determinacy axiom implies closure under the operation taking a set X to the least Σ_{n+1} admissible containing X (for $n = 1$, this is due to Welch [2012]). (Received February 04, 2013)