1154-03-1517 **Linda Brown Westrick*** (westrick@psu.edu). *Borel sets in reverse mathematics.*

Reverse mathematics is a program that seeks to answer the question: which set-existence axioms are needed to prove theorems of ordinary mathematics? However, even the simplest theorems about Borel sets – that they have the property of Baire and are measurable – had not been analyzed in a satisfactory way. The standard definition of a Borel set in reverse mathematics has the axiom of arithmetic transfinite recursion (ATR) already baked into it. Thus no interesting reversals could be obtained for theorems such as the above, which are usually proved using only ATR. We propose a new definition for a Borel set in reverse mathematics, that of a *completely determined* Borel set. Using this definition, we find that "Every Borel set has the property of Baire" and "Every Borel set is measurable" are strictly weaker than ATR but do imply the existence of Δ^1_1-generics and Δ^1_1-randoms respectively. The same techniques permit a tighter analysis of the Borel dual Ramsey theorem for 3-partitions, and are beginning to populate a previously uncharted territory of the reverse mathematics universe. (Received September 16, 2019)