Meeting: 1003, Atlanta, Georgia, SS 6A, AMS-ASL Special Session on Reverse Mathematics, I

1003-03-1477 **Harvey M. Friedman*** (friedman@math.ohio-state.edu), The Ohio State University, Department of Mathematics, 231 W. 18th Ave., Columbus, OH 43210. *RM Coding Theory.* Preliminary report.

We develop a theory of coding in reverse mathematics. For good reasons, the standard language of RM is very spartan - the sorts N,P(N), with epsilon,0,S,+,x, and = on N. This requires the use of coding for RM. The codings are normally given without justification. In most cases, the codings are regarded as unproblematic applications of general logic culture. In more advanced cases, codings have been properly challenged. The issue has been already raised by some for continuous functions. Clearly in measure theory, a number of delicate coding issues arise. Our theory of coding is based on the notion of iso-axiomatization. Suppose we wish to introduce a new notion(s) in RM. We normally introduce it by coding. To "justify" the coding, we give an iso-ax of the coding. This consists of a finite set of fundamental mathematical statements involving the new notion(s) in raw uncoded form, together with a proof that "the coding is correct" in the appropriate precise sense. Appropriate iso-axs have been given for a number of basic codings in RM. (Received October 05, 2004)