1053-03-261 **Denis R. Hirschfeldt*** (`drh@math.uchicago.edu`), Department of Mathematics, University of Chicago, 5734 S. University Ave., Chicago, IL 60637. *Homogeneous models, PA degrees, and Weak König's Lemma.*

As an example of recent work on the effective content of basic model theory, which may well have analogs in the constructive setting, I will discuss the computability theoretic and reverse mathematical strength of the principle HMT that every countable, complete, consistent theory T has a countable homogeneous model $\mathcal{M}$. If T is decidable, then there are several ways to show that such an $\mathcal{M}$ can be obtained effectively from a given PA degree (i.e., a Turing degree of a nonstandard model of Peano Arithmetic). In joint work with Csima, Harizanov, and Soare, we showed that the strength of PA degrees is in general necessary for building homogeneous models of decidable theories.

A degree $\mathbf{d}$ is PA iff every computable, infinite, binary branching tree has a $\mathbf{d}$-computable path. Thus PA degrees are closely linked to WKL_0, the subsystem of second order arithmetic consisting of the usual weak base system RCA_0 of reverse mathematics together with Weak König's Lemma, the principle that every infinite binary branching tree has an infinite path. Lange showed that HMT and WKL_0 are equivalent over RCA_0. (Received September 07, 2009)