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

1003-03-1127 **Barbara F. Csima**, **Denis R. Hirschfeldt** and **Richard A. Shore*** (shore@math.cornell.edu), Department of Mathematics, Malott Hall, Ithaca, NY 14853. *The atomic model theorem.* Preliminary report.

A formula $\varphi(x_1, \ldots, x_n)$ is an atom of a theory T if it generates an n-type in T, i.e., for every formula $\psi(x_1, \ldots, x_n)$ of T, $T \vdash \varphi \to \psi$ or $T \vdash \varphi \to \neg\psi$ (but not both). The theory T is atomic if, for every formula $\psi(x_1, \ldots, x_n)$ consistent with T, there is an atom $\varphi(x_1, \ldots, x_n)$ of T extending it, i.e. one such that $T \vdash \varphi \to \psi$. A model $\mathcal{A}$ of T is atomic if every n-tuple from $\mathcal{A}$ satisfies an atom of T. It is a classical theorem (AMT) that every complete atomic theory has an atomic model. This theorem is an example of a mathematical existence theorem weaker than ACA_0 and incomparable with WKL_0. We discuss the (reverse mathematical) relation of this theorem and related ones to ACA_0, WKL_0 and several combinatorial principles which are also implied by ACA_0 but incomparable with WKL_0. (Received October 04, 2004)