1014-03-1564 **William C Calhoun*** (wcalhoun@bloomu.edu), Bloomsburg University of Pennsylvania, Dept. of Math., Comp. Sci. and Stats., Bloomsburg, PA 17815. *Degrees of Monotone Complexity.*

Levin and Schnorr (independently) introduced the monotone complexity, $K_m(\alpha)$, of a binary string α. We use monotone complexity to define the relative complexity (or relative randomness) of reals. We define a partial ordering $\leq_{K_m}$ on 2^ω by $\alpha \leq_{K_m} \beta$ iff there is a constant c such that $K_m(\alpha \upharpoonright n) \leq K_m(\beta \upharpoonright n) + c$ for all n. The monotone degree of α is the set of all β such that $\alpha \leq_{K_m} \beta$ and $\beta \leq_{K_m} \alpha$. We show the monotone degrees contain an antichain of size $2^{\aleph_0}$, a countable dense linear ordering, and a minimal pair. We also show there is no minimal computably enumerable monotone degree.

Downey, Hirschfeldt, LaForte, Nies and others have studied a similar structure, the H-degrees, where H is the prefix-free Kolmogorov complexity. A minimal pair of H-degrees was constructed by Csima and Montalbán. Of particular interest are the noncomputable *trivial* reals, first constructed by Solovay. We define a real to be (K_m, H)-trivial if for some constant c, $K_m(\alpha \upharpoonright n) \leq H(1^n) + c$ for all n. We show every K_m-minimal real is (K_m, H)-trivial. (Received September 28, 2005)