Gregory Igusa and Julia F. Knight* (knight.1@nd.edu), 255 Hurley Hall, Mathematics Department, University of Notre Dame, Notre Dame, IN 46556, and Noah D. Schweber. Computing power of the ordered field of real numbers. Preliminary report.

The third author defined a reducibility that lets us compare the computing power of uncountable structures. We have $A \leq^*_w B$ if in a generic extension of $V$ in which both $A$ and $B$ countable, every copy of $B$ computes a copy of $A$. Using this reducibility, we compare the reals with some related structures. Let $\mathcal{R}$ be the ordered field of real numbers. Let $\mathcal{R}^*$ be an $\omega$-saturated extension of $\mathcal{R}$, and let $\mathcal{R}_{exp}$ be the expansion of $\mathcal{R}$ by the exponential function. The first two authors showed that $\mathcal{R}$ lies strictly above $\mathcal{R}^*$ under $\leq^*_w$. The extra computing power of $\mathcal{R}$ comes from the fact that it is Archimedean. The structures $\mathcal{R}$ and $\mathcal{R}_{exp}$ turn out to be equivalent. Some other expansions of $\mathcal{R}$ also turn out also not to have added computing power. (Received January 14, 2015)