1145-03-1244 **Jennifer Chubb**, **Russell Miller*** (russell.miller@qc.cuny.edu) and **Reed Solomon**.
Model completeness and relative decidability of countable structures.

The definition of a model-complete theory T is standard in model theory. It is equivalent for T to have quantifier elimination down to existential formulas. From the quantifier elimination, one quickly sees that every computable model of a computably enumerable, model-complete theory T must be decidable. We call a structure *relatively decidable* if this holds more broadly: if for all its copies $\mathcal{A}$ with domain ω, the elementary diagram of $\mathcal{A}$ is Turing-reducible to the atomic diagram of $\mathcal{A}$. In some cases, this reduction can be done uniformly by a single Turing functional for all copies of $\mathcal{A}$, or even for all models of a theory T.

We discuss connections between these notions. For a c.e. theory, model completeness is equivalent to uniform relative decidability of all countable models of the theory, but this fails if the condition of uniformity is excluded. On the other hand, for relatively decidable structures where the reduction is not uniform, it can be made uniform by expanding the language by finitely many constants to name certain specific elements. This is shown by forcing, and we conjecture that a similar result may hold for theories T such that every model of T is relatively decidable. (Received September 21, 2018)