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**Jason M Rute\*** ([jmr71@math.psu.edu](mailto:jmr71@math.psu.edu)), University Park, PA 16802. *Application of computable continuous model theory to a question in proof theory.*

There are many ways to express that a sequence converges. They range from the most explicit but least uniform—a rate of convergence; to the moderately explicit and moderately uniform—a bound on the number of jumps by epsilon; to the least explicit but most uniform—a bound of metastable convergence (which I will define in this talk).

Using proof theory, Kolhenbach showed that uniform metastable bounds can be computability extracted from the proof of a convergence theorem. Using model theory, Avigad and Iovino showed that metastable bounds of a convergence theorem are always uniform—but their methods do not provide a way to compute the bounds. Using computable analysis and computable model theory, I show that not only are the bounds always uniform, but they can be computed from the statement of the theorem alone (without regards to the proof). (Received August 08, 2015)