

1053-03-291

Wojciech Moczydlowski* (wojtek@google.com). *Bridging the Gap Between Replacement and Collection by Inaccessible Sets*. Preliminary report.

The nature of the relation between Replacement and Collection in the constructive world has been an intriguing problem ever since intuitionistic Zermelo-Fraenkel set theory (IZF) was introduced by Myhill in 1973. While in the classical setting the axioms are equivalent, the situation is far from clear once the excluded middle is eliminated. Friedman and Scedrov showed in 1985 that IZF_R , the version with Replacement, is weaker than IZF_C , the version with Collection, which is equiconsistent with ZF. They also conjectured that IZF_C proves consistency of IZF_R . No more is known.

We utilize inaccessible sets to shed light on this problem. More specifically, we show that $IZF_{R\omega}$ and $IZF_{C\omega}$, resulting by extending IZF_R and IZF_C with omega-many inaccessibles, are equiconsistent. By earlier results, their strength is the same as ZF_ω , the classical counterpart.

Since $IZF_{R\omega}$ has a normalizing proof system (Moczydlowski 2007) these results establish it as a remarkably powerful constructive setting. It possesses desirable properties such as Disjunction Property. Despite its inherent impredicativity, programs can be extracted from proofs. To the best of our knowledge, it is the strongest such theory in existence. (Received September 08, 2009)