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Dan Willard*, dew@cs.albany.edu. *On the Nature and Allowed Limited Extents of “Boundary-Case” Evasions of the Second Incompleteness Theorem.*

We have published seven papers about generalizations and unusual boundary-case exceptions for Gödel’s Second Incompleteness Theorem during 2001-2009

Hilb-2.1 : *“Purist” Question:* What kinds of arithmetics, if any can look at themselves and formalize some *strong* sense of their own consistency?

Hilb-2.2 : *The “Computer-Oriented” Question:* Are there some (perhaps weak senses) where any axiom system α can possess a sufficient *weakened form* of knowledge of its own consistency, so as to assist an automated theorem prover, which tries to predict its own theorem proving abilities, when using α as its axiom base?

There is essentially a definitive negative answer to question Hilb-2.1,. At the same time, both Gödel and Hilbert expressed ambivalence about fully embracing the Second Incompleteness Theorem. It is for this reason that Hilb-2.2’s revision of Hilbert’s Second Open Question becomes of interest. Our self-justifying axiom systems are certainly incapable of verifying their own consistency in a strong idealized sense: They do provide, however, some partial positive results for the Question 2.2 when the germane axiom system and deduction method are sufficiently weakened. (Received January 31, 2012)