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Undecidability in the Enumeration Degrees. Preliminary report.

In 1997, Slaman and Woodin [Arch. Math. Logic, 1997] proved the undecidability of the first-order theory of the enumeration degrees of the Σ_2^0 -sets. A closer analysis of their proof shows that they actually established the undecidability of the Π_5 -theory.

We improve this result to establish the undecidability of the Π_4 -theory by using a very different proof that extends a result of Ahmad and Lachlan [Math. Log. Q. 1998]. (Received August 25, 2004)