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Ax–Kochen/Ershov (AKE) principles are known for various classes of henselian valued fields, including tame valued fields (itself including the case of equal characteristic zero) and the unramified mixed characteristic case. While the case of equal characteristic $p > 0$ remains mysterious, in full generality, there has been progress in understanding the existential fragment of theories of such henselian valued fields.

In 2003, Denef and Schoutens obtained an axiomatization (and decidability) of the existential theory of $\mathbb{F}_p((t))$, expanded by a parameter for t, assuming Resolution of Singularties in characteristic $p > 0$. Recently, with Dittmann and Fehm, we have shown a similar result with a weaker assumption. More generally: assuming a weak consequence of resolution of singularities, we obtain a transfer principle for the existential decidability of fields equipped with a discrete equicharacteristic henselian valuation and a distinguished uniformizer.