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Model theory of valued difference fields

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A classical result by Ax-Kochen and Ershov provides a very good understanding of the model theory of finitely ramified henselian valued fields. “Model Theory of Frobenius on Witt Vectors” (preprint, Belair-Macintyre-Scanlon) pursues a similar goal in the context of valued difference fields, i.e., valued fields with a distinguished automorphism.

Our goal is to prove an analogue of the main result of the BMS paper in equal characteristic $p > 0$. We shall start by considering valued difference fields in equal characteristic zero, where the interaction between the valuation and the distinguished automorphism is different than that of the BMS context. Even though this seems irrelevant to the question at hand, it provides good insight to the model theory valued fields and valued difference fields in equal characteristic $p > 0$.