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Tyszka-characterisation property on automatic sequences

Our work is based on Tyszka's article: A discrete form of the theorem stating the non-existence of non-identical field endomorphisms of $\mathbb{R}$. Tyszka studies a characterisation property on a field and proves that this property is equivalent to algebricity on $\mathbb{R}$ and $\mathbb{Q}_p$. Amazingly, the same property is equivalent to rationality on $\mathbb{C}$.

We introduce a similar characterisation property which is equivalent to algebricity on normed and complete fields of characteristic 0. Our main interest is to study this new property on normed and complete integral domains of strictly positive characteristic and particularly on $\mathbb{F}_p[[X]]$.

We will underline the essential part played by Cartier's operators in these structures. By adding a hypothesis (related to Cartier's operators) on these integral domains, we will be able to prove an equivalency theorem for algebricity.