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Mark Spivakovsky* (mark.spivakovsky@math.univ-toulouse.fr). *Key polynomials in simple extensions of valued fields and the local uniformization problem in arbitrary characteristic.* Preliminary report.

Key polynomials and local uniformization.

Let $i : K \rightarrow L$ be a simple extension of valued fields. v is the valuation of L and its restriction to K . Key polynomials for i were introduced by MacLane when $v|_K$ is a discrete valuation. Simple extensions of valued fields with arbitrary (K, v) was studied by Vaquie and others. With DeCaup, Mahboub and Novacoski we simplified our theory of key polynomials. We will give the simplified presentation of the theory. Resol. of sing. is the problem of constructing, for an alg. var. X (and for a quasi-excellent noetherian scheme), a non-sing. alg. var. (resp. scheme) X' and a birat. proper morphism $X' \rightarrow X$. The local version of the problem is stated in terms of valuations. Let (R, M, k) be a local quasi-excellent domain and R_ν a valuation ring containing R birat. to R . We want to construct a reg. loc. ring R' essentially of finite type over R such that $R \subset R' \subset R_\nu$. Existence of R' is the Loc. Unif Th. it was proved by Zariski when $\text{char } k = 0$ and is an open problem when $\text{char } k = p > 0$. We will give our definition of key polyn. and discuss their properties. We will proceed to the applications to the problem of Loc. Unif in char. > 0 (Received February 16, 2018)