

Ramification Theory for Arbitrary Valuation Rings in Positive Characteristic

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Our goal is to develop ramification theory for arbitrary valuation fields, that is compatible with the classical theory of complete discrete valuation fields with perfect residue fields. We consider fields with more general (possibly non-discrete) valuations and arbitrary (possibly imperfect) residue fields. The defect case, i.e., the case where there is no extension of either the residue field or the value group, gives rise to many interesting complications.

In [VT16], we present some new results for Artin-Schreier extensions of valuation fields in positive characteristic. These results relate the higher ramification ideal of the extension with the ideal generated by the inverses of Artin-Schreier generators via the norm map. We also introduce a generalization and further refinement of Kato's refined Swan conductor in this case. Similar results are true in the mixed characteristic case.

[VT16] Vaidehee Thatte, "Ramification Theory for Artin-Schreier Extensions of Valuation Rings", *Journal of Algebra* (2016), pp. 355-389