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Title: Ramification Theory for Arbitrary Valuation Rings in Positive

Abstract: In classical ramification theory, we consider extensions of complete discrete valuation rings with perfect residue fields. We would like to study arbitrary valuation rings with possibly imperfect residue fields and possibly non-discrete valuations of rank ≥ 1, since many interesting complications arise for such rings. In particular, defect may occur (i.e. we can have a non-trivial extension, such that there is no extension of the residue field or the value group).

We present some new results for Artin-Schreier extensions of arbitrary valuation fields in positive characteristic p. 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 shall also introduce a generalization and further refinement of Kato's refined Swan conductor in this case. Similar results are true in mixed characteristic $(0, p)$.