Abrashkin, V. A.

Ramification filtration of the Galois group of a local field. II. (English. Russian original)

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Proc. Steklov Inst. Math. 208, 15-62 (1995); translation from Tr. Mat. Inst. Steklova 208, 18-69 (1995).

[For Part I, see *V. A. Abrashkin*, Tr. St-Peterbg. Mat. Obshch. 3, 47-127 (1995; Zbl 0853.11096), as well as the English translation in Proceedings of the St. Petersburg Math. Soc. 3, Transl., Ser. 2, Am. Math. Soc. 166, 35-100 (1995; Zbl 0873.11063).]

Let K be a complete local field of characteristic $p > 0$ with a residue field k. The Galois group $Gal(K^{sep}/K) = \Gamma$ has a ramification filtration $\{\Gamma^v\}_{v\in\mathbb{Q}_+}$. Let I be the union of all Γ^v with $v > 0$. I is a free pro-p-group. The paper contains an explicit description of the image of the ramification filtration in the group I/C_p, where $C_p = \{\text{all commutators of order} > p-1\}$. As a first step the author introduces a non-commutative generalization of the Artin-Schreier theory for p-extensions of nilpotency class $< p$. It works for arbitrary fields of characteristic $p > 0$ and is grounded on an equivalence of category of finite Lie $\mathbb{Z}_p$-algebras L (of nilpotency class $< p$) and of category of finite p-groups G with the same condition ($G := G(L)$). This theory has an independent interest. Next, the author identifies I/C_p with $G(\mathcal{L})$ for $\mathcal{L}$ a free Lie pro-$\mathbb{Z}_p$-algebra. He assumes that $k =$

F_p. Then an explicit filtration $\mathcal{L}^{(v)}$ in $\mathcal{L}$ is defined and it is shown that it coincides with the ramification filtration under the constructed identification. The proofs are given modulo 3-commutators and the general case will be considered in the next paper. Some version of the main theorem for $k = \mathbb{F}_p$ and the Galois group of the maximal p-extension are also given.

For the entire collection see [Zbl 0863.00012].

Reviewer: A.N.Parshin (Moskva)

MSC:

11S20 Galois theory
11S15 Ramification and extension theory