Regular Formal Modules in One-dimensional Local Fields *

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Abstract

Studies of regular local fields were started in 1962 in Z. I. Borevich's article during his work on tamely ramified extensions. This article generalizes idea of local fields regularity in terms of formal groups and corresponding formal modules. The article considers formal group over a ring of integers of a local field (finite extension of p-adic numbers) and a formal module built via this formal group over a ring of integers' maximal ideal. To be regular formal module should not contain non-trivial roots of isogeny of corresponding formal group. The article describes totally regular in terms of formal groups local fields, i.e. fields, which are together with all their unramified extensions are regular in terms of formal group. Original Borevich's work may be considered as solution for a case of multiplicative formal groups. This paper is the next step that provides description for totally regular local fields and corresponding formal modules in cases of polynomial formal groups, Lubin-Tate formal groups and Honda formal groups. After classification in special cases was received new problems are stated in the article, e.g. regular and totally regular modules description in multi-dimensional case.

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