Миникурс

Higher dimensional class field theory following Wiesend

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Миникурс пройдет 26.03, 27.03, 28.03, 01.04 в 17:00 в аудитории 209.

In this series of lectures I will give an introduction to Wiesend's class field theory for higher dimensional arithmetic schemes. It is more elementary than the class field theory of Bloch-Kato-Saito and therefore better suited for applications in some situations.

The setting is as follows: Given a regular scheme X, flat and of finite type over $Spec(\mathbb{Z})$, there exists a higher idèle class group $\mathcal{C}_X$ which is build out of data attached to all curves on X. There is a natural reciprocity homomorphism

$$rec:\ \mathcal{C}_X \longrightarrow \pi_1^{et}(X)^{ab}$$

such that for every finite étale Galois covering $Y \to X$ the induced homomorphism

$$\mathcal{C}_X/N_{Y|X}(\mathcal{C}_Y) \longrightarrow Gal(Y|X)^{ab}$$

is an isomorphism. The higher idèle class group carries a natural topology and, as in classical (i.e. one-dimensional) class field theory, the norm groups are exactly the open subgroups. Similar results hold for smooth varieties over finite fields, however, in this case the theory describes the tamely ramified coverings only.

The central idea is to consider *covering data*, which are compatible systems of finite (not necessarily abelian) étale Galois coverings of all curves on X and to investigate the question whether they are induced by coverings of X.