The Fundamental Curve of $p$-Adic Hodge Theory

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Abstract

Let $\overline{K}$ an algebraic closure of a $p$-adic field $K$. We construct a separated noetherian regular scheme $X$ (nonalgebraic) equipped with an action of $G_K = Gal(\overline{K}/K)$. We have $H^0(X, O_X) = \mathbb{Q}_p$ and $H^1(X, O_X) = 0$. For each rational number $\lambda$, there is exactly one isomorphism class of stable vector bundles of slope $\lambda$. The two main theorems of $p$-adic Hodge theory can be deduced from the classification of vector bundles over $X$ (joint work with Laurent Fargues).