Séminaire de théorie des nombres

Le 30 juin 2008 à 14h

Effective models and extension of $\mathbb{Z}/p^2$-torsors

Exposé de Dajano Tossici (Max Planck Institute)

Résumé : Let R be a discrete valuation ring of unequal characteristic with fraction field K which contains a primitive p^2-th root of unity. Let X be a faithfully flat R-scheme and let G be a finite abstract group. Let us consider a G-torsor $Y_K \to X_K$ and let Y be the normalization of X in Y_K. If $G = \mathbb{Z}/p^n$ with $n \leq 2$, under some hypothesis on X, we attach some invariants to $Y_K \to X_K$. If $p > 2$, we determine through these invariants when $Y \to X$ has a structure of a G-torsor extending the torsor $Y_K \to X_K$. Moreover we explicitly calculate the effective model (defined by Romagny) of the action of G on Y. The explicit classification of R-group schemes isomorphic to $\mathbb{Z}/p^n$ ($n \leq 2$) over K plays a crucial role. For $n = 1$ this classification was already known and the problem of extension of $\mathbb{Z}/p$-torsors has already been studied (for instance by Raynaud, Green-Matignon, Henrio, Saïdi) when X is a formal curve. The problem of extension of torsors arises naturally in the local study of group actions on an R-scheme.