Control Theorems in characteristic $p > 0$ for non commutative Iwasawa Theory

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Abstract.

Let F be a global function field of characteristic $p > 0$, K/F an ℓ-adic Lie extension unramified outside a finite set of places and $\Lambda(K) = \mathbb{Z}_\ell[[Gal(K/F)]]$ the associated Iwasawa algebra. For an abelian variety A/F we will describe some generalizations of Mazur's Control Theorem and use them to give information on the $\Lambda(K)$-module structure of the Selmer groups of A. In order to be able to define characteristic elements for the Selmer groups we shall also consider their structure as $\mathbb{Z}_\ell[[Gal(K/K')]]$-modules, for some $\mathbb{Z}_\ell$-extension K'/F. Both cases $\ell = p$ and $\ell \neq p$ will be considered. If time allows, for the $\ell \neq p$ case, we will also provide cases in which the ℓ-part of the Selmer group has no nontrivial pseudo-null submodules.