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Iwasawa Invariants of fine Selmer groups of congruent abelian varieties

Let K be a number field and let A_1 and A_2 be abelian varieties defined over K . Assume that $A_1[p^l]$ and $A_2[p^l]$ are isomorphic as G_K -modules for some sufficient large l . Let K_∞ be a strongly Σ -admissible p -adic Lie extension (for a suitable set of primes Σ). Generalizing work of Greenberg-Vatsal and Lim-Sujatha we prove an inequality between the μ -invariants of the fine Selmer groups of A_1 and A_2 along the extension K_∞/K . If p^l annihilates the p -primary submodule of both Selmer groups we can even show that the μ -invariants are equal and that the p -primary subgroups are pseudo-isomorphic to each other. If K_∞/K is a \mathbb{Z}_p -extension we can derive relations of the corresponding λ -invariants – without assuming that μ vanishes.

This is joint work with Sören Kleine.