

The 7th East Asia Number Theory Conference

The ranks of rational points over Iwasawa extensions of abelian varieties with non-ordinary reduction

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Efforts to study abelian varieties by Iwasawa Theory are often hampered by non-ordinary reduction. The model that everyone wants to follow is Barry Mazur's "Rational Points of Abelian Varieties with Values in Towers of Number Fields", *Inventiones math.* 18, 183--266 (1972), in which he presented a way to bound the ranks of the Mordell-Weil groups of an abelian variety over $F(\mu_{p^n})$ ($n > 0$) by the number of roots of a certain characteristic polynomial assuming the abelian variety has good ordinary reduction at every prime above p .

Far less is known when the abelian variety has non-ordinary reduction at any prime above p . The only case where our knowledge is relatively complete is elliptic curves over \mathbb{Q} due to Perrin-Riou, Kobayashi, Pollack, et. al. (and possibly elliptic curves over unramified fields).

In this presentation, I will present B. Im and my work that generalizes Perrin-Riou's Iwasawa Theory to abelian varieties over any number field which is totally ramified at every prime above p (and the only assumption about reduction is that the abelian varieties have good reduction). In particular, we obtain bounds of the Mordell-Weil groups of the abelian varieties, which could not be obtained previously. As an example, we present the bounds of the Mordell-Weil groups of the Jacobian varieties of hyperelliptic curves.

