Séminaire de théorie des nombres

Le 30 juin 2014 à 14h (PRG)

Beilinson-Kato elements and a conjecture of Mazur-Tate-Teitelbaum

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Résumé : A conjecture of Mazur, Tate and Teitelbaum (MTT) compares the order of vanishing of the p-adic L-function attached to an elliptic curve E at $s = 1$ to that of the Hasse-Weil L-function (where the latter is called the analytic rank of E). When E has split multiplicative reduction at p, the p-adic L-function always vanishes at $s = 1$ and MTT conjectured that its order of zero is exactly one more than the analytic rank of E in that particular case. In 1992, Greenberg and Stevens proved this conjecture when the analytic rank is zero. I will explain a proof of the MTT conjecture when the analytic rank is one (modulo the non-degeneracy of Nekovar's p-adic height pairing). The main ingredient is the p-adic Gross-Zagier-style formula we prove for the p-adic height of the Beilinson-Kato elements. If time remains, I will discuss an extension (joint with D. Benois) of this result to the case of a modular form f of weight greater than 2. The main difficulty in this case lies in the fact Deligne's Galois representation V attached to f is no longer p-ordinary in the presence of "extra zeros". This difficulty is circumvented relying on the fact that the (local Galois representation) V admits a triangulation over the Robba ring (thence it is "ordinary" in the level of the associated $(\phi - \Gamma)$-modules).