Séminaire de théorie des nombres

Le 28 avril 2003 à 14h15

p-Adic L-Functions and the Evil Twin

Exposé de Glenn Stevens

Résumé : In the classical theory of modular forms, the Eichler-Shimura theorem associates parabolic cohomology classes to classical cusp forms. In attempting to extend the Eichler-Shimura theory to p-adic analytic families of modular forms one encounters subtle problems of local freeness and semi-simplicity of Hecke algebras acting on certain overconvergent cohomology spaces. To solve these problems, more concrete knowledge is needed about these cohomology spaces.

This talk will give an analytic construction of a p-adic L-function associated to the "evil twin" of a classical ordinary eigenform. A dichotomy arises out of this construction : the critical values of the p-adic L-function either (1) all vanish, or (2) agree with the complex L-values up to standard multipliers. I will explain how this is related to semi-simplicity of the Hecke algebra acting on the overconvergent cohomolgy. Moreover, I will describe joint work with Robert Pollack, in which we establish a sufficient condition for the latter conclusion in terms of modular forms modulo p. I will also present some intriquing numerical data on the disribution of the zeroes of these p-adic L-functions that arose out of our work.