Séminaire de théorie des nombres

Le 3 mai 2010 à 14h

L-functions of elliptic curves over function fields

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Résumé : The L-function of a non-isotrivial elliptic curve over a function field is known to be a polynomial with integer coefficients. After discussing a brute-force method to compute this polynomial, we will provide optimizations that allow for the efficient computation of the L-function of any elliptic curve. These computations were carried out for a handful of curves to form a large database of elliptic curve L-functions that has been used for various investigations. Time permitting, we will discuss a pair of such investigations : statistics supporting Goldfeld's conjecture on the average value for the analytic rank in a family of twists of a fixed elliptic curve and progress toward provably computing the size of the Shafarevich-Tate group associated to a given elliptic curve. This is joint work with Chris Hall.