Séminaire de théorie des nombres

Le 2 mars 2009 à 14h

On the arithmetic of modular curves of D-elliptic sheaves

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Résumé : The notion of D-elliptic sheaf is a generalization of the notion of Drinfeld module. D-elliptic sheaves and their moduli schemes were introduced by Laumon, Rapoport and Stuhler in their proof of certain cases of Langlands conjecture over function fields.

We discuss basic arithmetic properties of modular curves of D-elliptic sheaves and draw parallels with the theory of Shimura curves. In particular, we produce a genus formula for modular curves of D-elliptic sheaves, examine the existence of rational points on these curve, compute their fundamental domains in Bruhat-Tits trees, and determine the cases when these curves are hyperelliptic. As applications of previous results, we construct new asymptotically optimal sequences of curves over finite fields (such sequences are important in coding theory), and find presentations for certain arithmetic groups arising from quaternion algebras over function fields.