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## Arithmetic on Modular Curves

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Book Condition: New. Publisher/Verlag: Springer, Basel | One of the most intriguing problems of modern number theory is to relate the arithmetic of abelian varieties to the special values of associated L-functions. A very precise conjecture has been formulated for elliptic curves by Birch and Swinnerton-Dyer and generalized to abelian varieties by Tate. The numerical evidence is quite encouraging. A weakened form of the conjectures has been verified for CM elliptic curves by Coates and Wiles, and recently strengthened by K. Rubin. But a general proof of the conjectures seems still to be a long way off. A few years ago, B. Mazur [26] proved a weak analog of these conjectures. Let  $N$  be prime, and  $f$  a weight two newform for  $\Gamma_0(N)$ . For a primitive Dirichlet character  $\chi$  of conductor prime to  $N$ , let  $\text{Af}(\chi)$  denote the algebraic part of  $L(f, \chi, 1)$  (see below). Mazur showed in [26] that the residue class of  $\text{Af}(\chi)$  modulo the "Eisenstein" ideal gives information about the arithmetic of  $X_0(N)$ . There are two aspects to his work: congruence formulae for the values  $\text{Af}(\chi)$ , and a descent argument. Mazur's congruence formulae were...



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