

ON TWO VARIABLE p -ADIC L -FUNCTIONS

RODNEY IAN YAGER

Let E be an elliptic curve defined over an imaginary quadratic field K with complex multiplication by the ring of integers of K . It has long been felt that certain special values of the complex Hecke L -functions attached to powers of the Grossencharacter of the curve E over K are deeply related to the arithmetic of the curve.

Recent results of Katz have shown the existence of two variable p -adic L -functions which interpolate these special values. The purpose of this thesis is to relate these p -adic L -functions to the arithmetic of the curve E . In particular, it will be shown that they are the characteristic power series of certain Iwasawa modules attached to the curve E .

Department of Mathematics,
Massachusetts Institute of Technology,
Cambridge,
Massachusetts 02139,
USA.

Received 19 January 1982. Thesis submitted to the Australian National University, July 1981. Degree approved January 1982. Supervisor: Professor J. Coates.