

1022-11-71

Amod S Agashe* (agashe@math.fsu.edu), Amod Agashe, Dept. of Math, FSU, 208 Love Building, Tallahassee, FL 32306. *The modular degree, congruence number, and multiplicity one.*

In this talk, we will report on joint work with William Stein and Ken Ribet. Let E be an elliptic curve over the rationals. The modular degree of E is the degree of its modular parametrization, while the congruence number of E is the biggest integer modulo which the modular form associated to E is congruent to another eigenform in a certain subspace. Both invariants are of independent interest, and our talk is about the relationship between the two. It is known that the modular degree divides the congruence number. Frey and Muller asked if the two numbers are equal. We found examples where they aren't, and we shall explain how in many of these examples, a certain "multiplicity one" principle for Galois representations fails. At the same time, we will report on our new result that if a prime divides the ratio of the congruence number to the modular degree, then its square divides the conductor of E . (Received September 08, 2006)