

1035-11-662

**Trevor S Arnold\*** ([tsarnold@math.washington.edu](mailto:tsarnold@math.washington.edu)), Department of Mathematics, Box 354350, Seattle, WA 98195. *Iwasawa theory, Hida families, and vanishing of  $L$ -functions*. Preliminary report.

The classical conjecture of Birch and Swinnerton-Dyer and its generalization by Bloch and Kato predict that the order of vanishing of the  $L$ -function  $L(f, s)$  attached to a modular form  $f$  at its central point is equal to the (co)rank of a Selmer group attached to  $f$ . We describe an Iwasawa-theoretic method for proving that the order of vanishing of  $L(f, s)$  is positive if and only if the appropriate Selmer group has positive rank. This method has been carried out for modular forms with complex multiplication, but the general case depends on several conjectures. (Received September 13, 2007)