1004-11-51 **Scott Ahlgren** (`ahlgren@math.uiuc.edu`), 1409 West Green Street, Urbana, IL 61801, and
Matthew Boylan* (`boylan@math.uiuc.edu`), 1409 West Green Street, Urbana, IL 61801.
Non-vanishing of central critical values of modular L-functions modulo p.

Let F(z) be a newform of weight 2k, let D be a fundamental discriminant, and let L(F,D,s) be the L-series of F twisted by the Kronecker character of discriminant D. In this talk, I will show that if there are two D (subject to some local conditions) for which the algebraic part of the central critical value L(F,D,k) is not 0 (mod p), then there are infinitely many such D. This result depends on non-vanishing results for the Fourier coefficients of half-integral weight modular forms modulo p, which are of independent interest. I will also discuss applications to elliptic curves and orders of Shafarevich-Tate groups. This is joint work with Scott Ahlgren. (Received January 12, 2005)