1023-11-451   **David M Goss*** (`goss@math.ohio-state.edu`), Department of Mathematics, The Ohio State University, Columbus, OH 43210. *Hecke Operators and L-series in Characteristic p.* Preliminary report.

Through very clever use of special values (in particular, trivial zeroes) Euler discovered the functional equation of the Riemann zeta-function many decades before Riemann. In turn the functional equation implies that the trivial zeroes are simple.

Simply copying Euler does not suggest a "functional equation" for characteristic p L-series. Recent work of Dinesh Thakur and Javier Diaz-Vargas, however, suggests that the orders of their trivial zeroes also behave extremely nicely (but non-classically!) implying some sort of deeper structure.

One approach to functional equations is via modular forms. For Drinfeld modules, the associated Hecke operators act totally mulitplicatively. Furthermore, one can explicitly compute the eigenvalues of special cusp forms by using the first non-trivial q-expansion coefficient. The Hecke action on the higher coefficients has remained a mystery.

Trivial zeroes of characteristic p L-series belong to certain "special polynomials" whose degree grows logarithmically. This is a crucial fact and is established via various vanishing results. In this talk we will show how such vanishing results *also* work for Hecke operators, thereby giving an approach to the higher-coefficients. (Received September 13, 2006)