Jesse Thorner* (jthorner@stanford.edu). Averages of twisted GL(2) L-functions.

Let $K$ be a number field, and let $\pi$ be a cuspidal automorphic representation of GL(2) over $K$. Rohrlich proved that for any fixed complex number $s_0$, there exist infinitely many ray class characters $\chi$ of $K$ for which $L$-function $L(s_0, \pi \otimes \chi, K) \neq 0$.

Using mean value theorems for $L(s, \pi \otimes \chi, K)$ arising from the theory of multiple Dirichlet series and large sieve inequalities for ray class characters due to Blomer, Goldmakher, and Louvel, we make Rohrlich’s result quantitative when $L(s, \pi, K)$ satisfies the generalized Ramanujan conjecture. We also obtain non-vanishing results for $L'(1/2, \pi, K)$, and we nontrivially bound the average analytic rank of $L(s, \pi, K)$ in families of quadratic twists. (Received September 13, 2016)