1086-VO-1503 **Jesse Thorner*** (`thorja11@wfu.edu`). *Explicit Bounds for Densities Pertaining to Lehmer-Type Questions.*

Given a newform $f \in S_k(\Gamma_0(N))$ with squarefree level N and trivial character, we will present tools that will help provide explicit lower bounds for the density of Fourier coefficients of f which do not equal zero. In particular, we will prove that if f has a Fourier expansion $\sum_{n=1}^{\infty} a(n)q^n$, where $q = e^{2\pi i z}$, and x is a positive number, then

$$\#\{x \leq p \leq 2x : \; p \text{ prime}, \; a(p) = 0\} \leq 0.42x^{3/4}$$

for sufficiently large x. This assumes that the symmetric-power L-functions of f are L-functions for which the Generalized Riemann Hypothesis is true. Additionally, using a slightly weaker result, we will prove that if $\tau(n)$ is the Ramanujan tau function, then the density of positive integers for which $\tau(n) \neq 0$ is greater than 0.9999. (Received September 22, 2012)