1077-11-2204 **Jake Levinson*** (jakelev@umich.edu) and **Steven J Miller**. *The n-level density of zeroes of quadratic Dirichlet L-functions.*

The statistical distributions of zeros of L-functions have wide-ranging applications in number theory and geometry. L-functions have been studied in connection with random matrix theory, which provides easier methods of computing these distributions. One statistic, the n-level density of low-lying zeros for a family of L-functions, measures the distribution of zeros near the central point $s = 1/2$. According to the Density Conjecture of Katz and Sarnak, this statistic depends on a classical compact group associated to the family. We extend previous work by Gao, who computed the n-level densities of quadratic Dirichlet L-functions, and showed equality with random matrix theory up to $n = 3$, for test functions of suitably restricted support. We develop a method to streamline the comparison with the prediction from random matrix theory. The key step is to find a 'canonical' form for several Fourier Transform identities, which allows us to verify them via combinatorial arguments. Our main result is to confirm up to $n = 6$ that, for test functions of suitable support, the density is that of the Symplectic Gaussian Ensemble. (Received September 21, 2011)