1128-11-159   **Steven J Miller*** (`sjm1@williams.edu`), 18 Hoxsey St, Williamstown, MA 01267. *Biases in Fourier Coefficients of Elliptic Curve L-functions.* Preliminary report.

We report on work in progress on lower-order biases in elliptic curve Fourier coefficients, and if time permits other families of L-functions. For non-CM families, Michel proved the second moment of the Fourier coefficents is $p^2 + O(p^{3/2})$. Cohomological arguments show that the lower order terms are of sizes $p^{3/2}, p, p^{1/2}$ and 1. In every case we are able to analyze, the largest lower order term in the second moment expansion that does not average to zero is on average negative. We prove this bias conjecture for several large classes of families, including families with rank and unusual distributions of functional equation signs. We also identify all lower order terms in large classes of families, shedding light on the arithmetic objects controlling these terms. The negative bias in these lower order terms has implications toward the excess rank conjecture and the behavior of zeros near the central point of elliptic curve L-functions. This work is joint with Megumi Asada, Eva Fourakis, Andrew Kwon, Blake Mackall, Karl Winsor and Kevin Yang. (Received February 24, 2017)