

Meeting: 1003, Atlanta, Georgia, SS 32A, AMS Special Session on Arithmetic Algebraic Geometry, I

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Kevin L James* (kevja@clemsn.edu), BOX 340975, Clemson, SC 29634. *Average Frobenius
distributions for elliptic curves with rational torsion.* Preliminary report.

Let E/\mathbb{Q} be an elliptic curve and let $a_p(E) = p + 1 - \#E(\mathbb{F}_p)$. For any integer r Lang and Trotter have conjectured that

$$\#\{p < X : a_p(E) = r\} \sim C_{E,r} \frac{\sqrt{X}}{\log X},$$

where $C_{E,r}$ is an explicit constant depending only on E and r . It has been proved by Fouvry and Murty and David and Pappalardi that a similar asymptotic holds if one averages over all elliptic curves. In this talk, we will give a brief explanation of the Lang-Trotter conjecture and quickly recall the works of Fouvry, Murty, David and Pappalardi. We will then discuss average Lang-Trotter type results for families of elliptic curves with non trivial rational torsion subgroups. (Received October 01, 2004)