1077-11-2462 **Derek Garton*** (garton@math.wisc.edu). *The Cohen-Lenstra heuristics, roots of unity, and random matrices.* Preliminary report.

It is well known (in certain circles) that some of the conjectures that follow from the Cohen-Lenstra heuristics for number fields appear to be false when there are pth roots of unity in the base field. Recently, Malle even formulated an alternate conjecture based on extensive (and convincing) numerical data. However, the reason for his conjecture remains mysterious to many. Fortunately, in the setting of function fields of curves over finite fields, much more is known about the Cohen-Lenstra heuristics. For example, Achter recently proved that a Cohen-Lenstra-type heuristic is in fact true in this setting (with the unfortunate caveat that the size of the base field must be allowed to increase). Moreover, the presence of pth roots of unity is now just a simple congruence condition on the characteristic of the finite field. It is thus possible to study the "failure" of the Cohen-Lenstra heuristics by studying statistics of certain "random" elements in a group of symplectic similitudes with multiplier satisfying a certain congruence condition. I have computed some of these statistics, and my results match Malle's conjecture, giving non-numerical justification for his conjecture. (Received September 22, 2011)