

1154-VS-1947 **Rachel Louise Petrik*** (rachel.petrik@uky.edu), 719 Patterson Office Tower, Lexington, KY 40506. *Improvements of the Chevalley-Warning Theorems*. Preliminary report.

The Chevalley-Warning theorems are a collection of results that give lower bounds for the number of solutions to systems of equations over finite fields. In particular, for a system of equations over a finite field, \mathbb{F}_q where $\text{char}(\mathbb{F}_q)=p$, if the number of variables is strictly greater than the sum of the degrees of the equations, then the number of solutions is congruent to 0 mod p . These bounds are best possible, as shown by simple cases. In 2011, D. R. Heath-Brown gave improvements to these results by excluding these simple cases. I have improved some of Heath-Brown's results in this area. Some of these improvements have resulted in best possible bounds. In this talk, I will briefly introduce the classical Chevalley-Warning theorems and then discuss my results. (Received September 16, 2019)