1116-14-796 **Brett Frankel*** (lastnamefirstinitial@math.upenn.edu). *Counting Local Systems on Supersingular Abelian Varieties.* Preliminary report.

In a 2008 paper, Hausel and Rodriguez-Villegas studied the moduli space of (twisted) local systems on a Riemann surfaces by computing the number of representations of the fundamental group in $GL_n(q)$. We will discuss some situations where instead of a Riemann surface, one considers an abelian variety defined over an algebraically closed field of characteristic p. The space of such representations turns out to be a constructible set. For a supersingular abelian variety A, we count the number of representations of the etale fundamental group of A to $GL_n(q)$, where q is a power of p. This count (for fixed n) turns out to be a polynomial in q. We give an explicit formula for this polynomial, then state a few theorems which elucidate its features. In particular, we state a new result which generalizes to cosets a theorem of Frobenius about the number of solutions to $x^n = 1$ in a finite group. (Received September 13, 2015)