1077-11-216 **Cassie L Williams*** (williams@math.colostate.edu), Department of Mathematics, 101 Weber Building, Colorado State University, Fort Collins, CO 80523. *Conjugacy classes in GSp_4 and an application to the enumeration of abelian surfaces.* Preliminary report.

While the conjugacy classes of GL_n are straightforward to understand, those of GSp_{2g} are more challenging. We have identified the conjugacy classes of $\mathrm{GSp}_4(\mathbb{Z}/\ell)$ and are interested in using them to determine and understand the classes of $\mathrm{GSp}_4(\mathbb{Z}/\ell^r)$. With this information we can give a new interpretation of the Euler factors of L-functions of abelian quartic CM fields. In 2003, Gekeler considered the Euler factors of the L-function of a quadratic imaginary field, which is related via the class number to the size of an isogeny class of elliptic curves, and found a relationship to the proportion of elements of $\mathrm{GL}_2(\mathbb{Z}/\ell^r)$ with given characteristic polynomial. Our results for $\mathrm{GSp}_4(\mathbb{Z}/\ell^r)$ extend this heuristic from elliptic curves to abelian surfaces. (Received August 13, 2011)