1017-22-40 **Donald R King*** (d.king@neu.edu), Math Department, 567 Lake Hall, Northeastern University, Boston, MA 02115. *Complexity of nilpotent orbits in complex symmetric space.*

Let G be the adjoint group of a semisimple Lie algebra $\mathfrak{g}$, and let $\pi : K_{\mathbf{C}} \rightarrow Aut(\mathfrak{p}_{\mathbf{C}})$ be the complexified isotropy representation at the identity coset of the corresponding symmetric space. Let Ω be a nilpotent G-orbit in $\mathfrak{g}$ and $\mathcal{O} = \mathcal{O}_{\Omega}$ be the nilpotent $K_{\mathbf{C}}$-orbit in $\mathfrak{p}_{\mathbf{C}}$ associated to Ω by the Kostant-Sekiguchi correspondence. Ω is a symplectic manifold under the Kostant-Souriau form. This gives a Poisson algebra structure to $C^{\infty}(\Omega)^{K}$, the space of smooth K-invariant real valued functions on Ω. We show that $c_{\mathcal{O}}$, the complexity of $\mathcal{O}$ as a $K_{\mathbf{C}}$ variety, measures the failure of $C^{\infty}(\Omega)^{K}$ to be commutative. In many cases this result facilitates the computation of $c_{\mathcal{O}}$. For example, when $\mathfrak{g} = sl(n, \mathbf{R})$, our result reduces the computation of $c_{\mathcal{O}}$ to an old result of G. J. Heckman. (Received February 02, 2006)