

1077-14-1788

Ellen J Goldstein* (ellen.goldstein@northwestern.edu). *Nilpotent Orbit Closures in the Symplectic and Orthogonal Groups*. Preliminary report.

For an algebraically closed field K of arbitrary characteristic, consider a linear algebraic group G over K and $\overline{\mathcal{O}_X}$, the (Zariski) closure of the adjoint orbit of an element X of the Lie algebra \mathfrak{g} . $\overline{\mathcal{O}_X}$ is a subvariety of \mathfrak{g} and it is an ongoing problem to determine under what circumstances $\overline{\mathcal{O}_X}$ is normal. For G the orthogonal or symplectic group, Kraft and Procesi showed that $\overline{\mathcal{O}_X}$ is a normal variety for certain nilpotent $X \in \mathfrak{g}$ when $\text{char } K = 0$. We begin to generalize their result for $\text{char } K = p \neq 2$, concluding that an orbit closure $\overline{\mathcal{O}_X}$ of a nilpotent element $X \in \mathfrak{g}$ is normal if and only if it is non-singular in all orbits \mathcal{O} of codimension 2 contained in the boundary of $\overline{\mathcal{O}_X}$. In particular, if $\overline{\mathcal{O}_X} \setminus \mathcal{O}_X$ does not contain any orbits of codimension 2, then $\overline{\mathcal{O}_X}$ is normal. (Received September 20, 2011)