1023-20-884 **Terrell L. Hodge*** (terrell.hodge@wmich.edu), Department of Mathematics, Western Michigan University, Kalamazoo, MI , and **David C. Murphy** (dmurphy@kzoo.edu), Department of Mathematics & Computer Science, Kalamazoo College, Kalamazoo, MI 49006. *On Some Nilpotent Orbits and Desingularizations of Their Closures.* Preliminary report.

Let G be a reductive algebraic group defined over an algebraically closed field k of characteristic p, which we assume is *good* for G. An involution θ of G determines the fixed point subgroup $K = G^\theta$, and a decomposition $\mathfrak{g} = \mathfrak{k} \oplus \mathfrak{s}$ of $\mathfrak{g} = \mathrm{Lie}(G)$ into ± 1-eigenspaces for $d\theta$. Here $\mathfrak{k} = \mathrm{Lie}(K)$, while the -1-eigenspace $\mathfrak{s}$ is the "infinitesimal" symmetric space which identifies with the tangent space at the identity to the symmetric space G/K. For $\mathcal{N}(\mathfrak{g})$ the nullcone of $\mathfrak{g}$, take $\mathcal{N}(\mathfrak{s}) = \mathfrak{s} \cap \mathcal{N}(\mathfrak{g})$. The adjoint action of G on $\mathcal{N}(\mathfrak{g})$ yields an action of K on $\mathcal{N}(\mathfrak{s})$.

Drawing parallels with the well-known and rich study of the G-orbits on $\mathcal{N}(\mathfrak{g})$, we consider desingularizations of orbit closures $\overline{\mathcal{O}}$ for $\mathcal{O}$ a K or K°-orbit in $\mathcal{N}(\mathfrak{s})$, and discuss applications to topics such as the normality of $\overline{\mathcal{O}}$ and cohomological interpretations of rings of functions for these orbits. (Received September 26, 2006)