Abstract: Let $g$ be a simple classical Lie superalgebra. In this talk we will construct subalgebras with detect the relative cohomology of $g$ with respect to $g_0$ through the use of invariant theory. This will allow us to define rank varieties and develop a theory of support varieties for modules over the Lie superalgebra. Later in the talk, we will indicate how these varieties provide a geometric interpretation of the combinatorial description of the defect of $g$ and the atypicality of simple $g$-supermodules due to Kac and Wakimoto.