1023-17-1201 **Brian D Boe*** (brian@math.uga.edu), Mathematics Department, University of Georgia, Athens, GA 30602, and **Jonathan R Kujawa** (kujawa@math.uga.edu) and **Daniel K Nakano** (nakano@math.uga.edu). *Cohomology for Lie superalgebras.*

Let $\mathfrak{g} = \mathfrak{g}_{\bar{0}} \oplus \mathfrak{g}_{\bar{1}}$ be a simple finite dimensional Lie superalgebra over $\mathbb{C}$. Let $\mathcal{F}$ denote the category of all finite dimensional $\mathfrak{g}$-supermodules which are completely reducible as $\mathfrak{g}_{\bar{0}}$-modules. Unlike finite dimensional modules for simple Lie algebras, the category $\mathcal{F}$ has a rich cohomology. Studying this cohomology is key to understanding the representation theory of $\mathfrak{g}$. If $\mathfrak{g}_{\bar{0}}$ is reductive as a Lie algebra then the cohomology ring of category $\mathcal{F}$ is finitely generated. Moreover, under mild restrictions on $\mathfrak{g}$, the cohomology theory of $\mathcal{F}$ is very closely related to that of a certain subsuperalgebra $\mathfrak{e} \subseteq \mathfrak{g}$.

These considerations lead to definitions of support varieties relative to $\mathfrak{g}$ and $\mathfrak{e}$ which are likewise closely related. The $\mathfrak{e}$-support is given by a rank variety construction which satisfies the standard properties of a support variety theory, and has interesting connections with the combinatorial notions of defect, atypicality, and superdimension. This talk will focus on the cohomology theory and the subalgebra $\mathfrak{e}$; a followup talk by Jonathan Kujawa will emphasize the support variety theories. (Received September 25, 2006)