1067-20-1403 **Brian Parshall***, Department of Mathematics, Kerchof Hall, University of Virginia, Charlottesville, VA 22903. *Some results on stability for algebraic groups.*

This talk is joint work with Leonard Scott. For a normal subgroup N of a group G, an N-module Q is G-stable if $Q \cong Q^g$, $\forall g \in G$. If the action of N on Q extends G, then Q is clearly G-stable; the converse need not hold. A conjecture in the modular representation theory of reductive groups G asserts that the (obviously G-stable) projective indecomposable modules (PIMs) Q for the Frobenius kernels of G have a G-module structure. It is sometimes just as useful (for general Q) to know that a finite direct sum $Q^{\oplus n}$ has a compatible G-module structure (numerical stability). In previous work, the authors established numerical stability for PIMs. Here we discuss a more general setting for that result, working in the context of group schemes and a suitable version of G-stability, called strong G-stability. We obtain a determination of necessary and sufficient conditions for the existence of a compatible G-module structure on a strongly G-stable N-module, in the form of a cohomological obstruction which must be trivial precisely when the G-module structure exists. Our main result is achieved by giving an approach to killing the obstruction by tensoring with certain finite dimensional G/N-modules. (Received September 20, 2010)