

1077-17-453

James E. Humphreys* (jeh@math.umass.edu). *Special nilpotent orbits and modular Lie algebra representations*. Preliminary report.

Let \mathfrak{g} be the Lie algebra of a simple algebraic group over an algebraically closed field of good characteristic $p > 0$. The simple modules for its universal enveloping algebra $U(\mathfrak{g})$ are those for finite dimensional reduced enveloping algebras $U_\chi(\mathfrak{g})$ with $\chi \in \mathfrak{g}^*$. The crucial case involves “nilpotent” χ . Given a regular block in $U_\chi(\mathfrak{g})$, it is natural to ask which power of p divides the dimension of each simple module in the block. The Kac–Weisfeiler Conjecture, proved by Premet, ensures that p^d divides all dimensions if the orbit of χ under the adjoint group has dimension $2d$; further work of Premet shows this power is best possible (at least for p “sufficiently large”). On the other hand, a higher power of p is sometimes observed. We discuss evidence that this may occur just when the orbit of χ is *non-special* in Lusztig’s sense. (Received September 02, 2011)