
CORNELIUS PILLEN, University of South Alabama

Lifting modules of a finite group of Lie type to its ambient algebraic group

Let G be a simple simply connected algebraic group over an algebraically closed field k of positive characteristic p . Inside G , the set of fixed points of the r th iterate of the Frobenius map form a subgroup, a finite of Lie type group, denoted by $G(p^r)$.

We are interested in the following question: Given a $kG(p^r)$ -module M , does there always exist a G -module that is isomorphic to M as a $kG(p^r)$ -module? A well-known result due to Robert Steinberg says that all the simple modules are obtained via restriction from G to $G(p^r)$. But in general the question has a negative answer.

This talk is a survey of known results together with several explicit SL_2 examples.