

Suppose one has a group G with a normal subgroup L , and a representation $\theta : L \rightarrow GL(V)$ for a finite-dimensional vector space V . A natural question in Representation Theory is whether this representation can be extended to a representation $\tilde{\theta} : G \rightarrow GL(V)$. In this talk, I shall construct an object resembling (but distinct from) an exact sequence which will provide cohomological conditions on existence and uniqueness of such an extension when V is G -stable. If time permits, I will demonstrate how this idea can also be used to give insight into the question of whether a representation of a Lie algebra \mathfrak{g} of an algebraic group G over a field of positive characteristic can be integrated to a representation of G . Joint work with Dmitriy Rumynin.