Meeting: 1003, Atlanta, Georgia, SS 8A, AMS Special Session on Modular Representation Theory of Finite and Algebraic Groups, I

1003-16-1421   **Jon F. Carlson*** (`jfc@math.uga.edu`), Department of Mathematics, University of Georgia, Athens, GA 30602, and **Klaus W. Roggenkamp**. *Lifting modules of group rings and Gorenstein orders using syzygy functors.*

Suppose that G is a finite group and R is the localization at a prime p of the ring of integers of an algebraic number field. Let π be a prime dividing p in R, and suppose that $k = R/\pi R$. In many studies of integral representation theory, ramification of the prime p is considered an unnecessary and complicating factor. Here we show that there are occasional advantages to having some ramification. In particular, with some ramification, if M is a kG-module, then the RG-syzygy $\Omega_{RG}(M)$ has the property that

$$\Omega_{RG}(M)/\pi\Omega_{RG}(M) \cong M \oplus \Omega_{kG}(M).$$

As a result, we note that $M \oplus \Omega_{kG}(M)$ is always liftable to an RG-lattice. Indeed, the category of kG-modules comes very close to having an embedding into the category of RG-lattices. The results apply more generally to orders in algebras. (Received October 05, 2004)