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INDUCTION THEOREMS FOR INFINITE GROUPS

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The purpose of this paper is to announce Theorems 1 and 4 below. These may be viewed as generalizations of theorems of Brauer, Swan, and Artin [**11**] to certain classes of infinite groups.

THEOREM 1. *Let G be a virtually polycyclic group. Let U be a G-graded ring with a unit in each degree, such that U_1 is Noetherian. Then the induction map*

$$\bigoplus_{\substack{H\subset G\\ \text{finite}}} K_0'U_H \to K_0'U_G \tag{1}$$

is surjective, where U_H is the part of U supported on H, for each $H \subset G$.

The proof depends on a structure theorem for such U.

Added in proof: I wish to thank Hyman Bass for carefully planning my course of graduate study to bring me into contact with this constellation of research questions. The idea for the structure theorem comes from a case of the general unpublished conjecture of Farrell and Hsiang that leads to recent work of Farrell-Jones and F. Quinn. The conjecture about K_0' was independently posed by S. Rosset [**7**] based on ring-theoretic evidence. I wish to thank Tom Farrell for showing me his conjecture with Hsiang and expressing confidence in the approach to Theorem 1.

In the special case that k is a field of characteristic 0 and U is the group algebra kG with the natural grading, Theorem 1 is equivalent to the following result announced by F. Quinn [**8**] (at least for $k = \mathbf{Q}$) in establishing Farrell and Hsiang's conjecture [**4**]:

$$K_0(kG) \simeq \varinjlim_{H\in\mathcal{F}(G)} K_0(kH) \tag{2}$$

($\mathcal{F}$ = Frobenius category of finite subgroups). In effect, as kG and all kH are regular, we may identify K_0 and K_0' via the Cartan map, so (2) $\Rightarrow$ (1). Conversely, in the diagram

$$\begin{array}{ccc}
\varinjlim_{H\in\mathcal{F}(G)} K_0(kH) & \to & K_0(kG)\\
\rotatebox{90}{$\hookleftarrow$}\, r & & \downarrow r\\
\varinjlim_{H\in\mathcal{F}(G)} T(kH) & \hookrightarrow & T(kG)
\end{array}$$

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