# TOPOLOGY SEMINAR

# The Dade group of a finite group and dimension functions

**By**

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**Abstract:** If $G$ is a $p$-group and $k$ is a field of characteristic $p$, then the Dade group $D(G)$ of $G$ is the group whose elements are the equivalence classes of capped endo-permutation $kG$-modules, where the group operation is given by the tensor product over $k$. The Dade groups of p-groups have been studied intensively in the last 20 years, and a complete description of the group $D(G)$ has been given by Bouc in terms of the genetic sections of $G$.

For finite groups the situation is more complicated. There are two definitions of a Dade group of a finite group given by Urfer and Lassueur, however both definitions have some shortcomings. In a recent work with Gelvin, we give a new definition for the Dade group $D(G)$ of a finite group $G$ by introducing a notion of Dade $kG$-module as a generalization of endo-permutation modules.

We show that there is a well-defined surjective group homomorphism $\Psi$ from the group of super class functions $C(G, p)$ to the Dade group $D^{\Omega} (G)$ generated by relative syzygies. Our main theorem is the verification that the subgroup of $C(G,p)$ consisting of the dimension functions of k-orientable real representations of $G$ lies in the kernel of $\Psi_G$. In the proof we consider Moore $G$-spaces which are the equivariant versions of spaces which have nonzero reduced homology in only one dimension, and use the techniques from homological algebra over the orbit category.

This is a joint work with Matthew Gelvin.

**Date:** Feb 8, 2021
**Time:** 13:30
**Place:** Zoom

To request the event link, please send a message to cihan.okay@bilkent.edu.tr