

DEFENSE OF THE DOCTORAL DISSERTATION

DEPARTMENT OF MATHEMATICS

“The Structure of $RO(G)$ -Graded Homotopy of Eilenberg-Mac Lane Spectra for Cyclic Two-Groups and the Slice Spectral Sequences”



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Monday, March 18, 2024

Time: 12:00 PM

Location: 311 DeBartolo Hall

Examination Committee:

Mark Behrens, Advisor

Andy Putman

Chris Schommer-Pries

Larry Taylor



Abstract:

We study the $RO(G)$ -graded homotopy Mackey functors of Eilenberg-Mac Lane spectra for cyclic p -groups. One innovation is the use of the generalized Tate squares introduced by Greenlees-May in the computations. We exploit the power of these generalized Tate squares further by applying them to the study of the equivariant slice spectral sequence invented by Dugger which is later generalized by Hill-Hopkins-Ravenel in their solution of the Kervaire invariant problem. Different parts of the squares provides stratification of the slice spectral sequences. We also deduce vanishing lines and transchromatic phenomenon in the negative cones of these spectral sequences, extending the work of Meier-Shi-Zeng on the positive cones. We also compute $RO(G)$ -graded coefficients in some other cases, as illustrations of the usefulness of the Tate squares in equivariant computations.