



Leibniz
Universität
Hannover

Oberseminar zur Algebra und Algebraischen Kombinatorik

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"On the automorphism group of extremal codes"

We will present some techniques developed to study the automorphism group of extremal self-dual binary linear codes. Our techniques involve in particular some modular representation theory and actions of permutation groups on finite combinatorial structures. The usual problem is to find a relatively small set of representatives for the action of a group on a set of codes and then do an exhaustive test on this set, checking properties such as minimum distance and self-duality.

In this talk we will concentrate on groups of order $2p$ with p an odd prime.

- Let C_{2p} be the cyclic group of order $2p$. Then we prove that the code is projective as an FC_{2p} -module if and only if a natural projection of the subcode fixed by the p -power of a generator of C_{2p} is self-dual. This is a nice link between coding-theoretical properties of the code and module-theoretical ones and it is a useful tool in the search of extremal codes.

- Let D_{2p} be the dihedral group of order $2p$. In this case, following the proof of Maschke's Theorem, one gets a decomposition of the code with the automorphisms of order p in D_{2p} . This decomposition is refined with the action of the involution, resulting in a very nice structure for the code.

We will present the methods and then some applications to the study of the automorphism group of the putative self-dual extremal code of length 72.

Mittwoch, 20.11.2013
ab 10:15 Uhr, Raum d326

Hauptgebäude der Leibniz Universität Hannover

Alle Interessierten sind herzlich eingeladen.

gez. Prof. Dr. C. Bessenrodt

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