

## CODES FROM $N$ -DIMENSIONAL POLYHEDRA AND $N$ -DIMENSIONAL CYCLIC CODES

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Error control codes are widely used to increase the reliability of transmission of information over various forms of communications channels. J. Hansen has recently introduced linear codes obtained using the geometry of polyhedra in ordinary real vector spaces. Given an  $n$ -dimensional polyhedron,  $P$ , each integer lattice point in  $P$  determines a monomial in  $n$  variables. These monomials are evaluated at all  $n$ -tuples of non-zero elements in a finite field to produce codewords in a basis for the code. In our work, we examine parameters of these codes, which we call “toric” codes, generated from several families of polyhedra in two and three-dimensional vector spaces. We also show that toric codes are  $n$ -dimensional cyclic codes, in an effort to better describe toric codes.