

Construction of Hadamard $Z_2Z_4Q_8$ -codes

Abstract

This work deals with Hadamard $Z_2Z_4Q_8$ -codes, which are binary codes after a Gray map from a subgroup of the direct product of Z_2 , Z_4 and Q_8 groups, where Q_8 is the non-commutative quaternion group. These kind of codes have five types ("shapes") and the values or range of values of several characteristic parameters is analyzed. Specifically, we show that all these codes can be represented in a standard form from a set of generators, as well as using the parameters of dimension of the kernel and rank. In addition, we present several methods that allow, given some preselected values of these parameters, the construction of Hadamard $Z_2Z_4Q_8$ -codes fulfilling them.