

Hamming weight distributions of linear simplex codes over finite chain rings and their Gray map

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A linear code of length n over a finite chain ring R with residue field \mathbb{F}_q is a R -submodule of R^n . A R -linear code is a code over \mathbb{F}_q (not necessarily linear) which is the generalized Gray map image of a linear code over R . In this work, we present the construction of linear simplex codes over R and their corresponding R -linear codes of type α and β . Moreover, we show the fundamental parameters of these codes as well as their complete weight distributions. We also study whether these simplex codes are optimal with respect to the Griesmer-type bound.