

On two-weight codes over rings

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Dedicated to Spyros Magliveras on occasion of his 70's birthday.

Abstract. There is a close relation between strongly regular graphs and linear two-weight codes over rings \mathbf{Z}_n . The codewords of two-weight codes attain exactly two different nonzero (homogeneous) weights. In this talk the results of a computer search for two-weight codes are presented. The restrictions on the codewords can be formulated as a Diophantine linear system of equations, which usually is hard to solve on today's computers.

By prescribing a group of automorphisms on the two-weight code the search space can be reduced dramatically. This so called Kramer-Mesner method has been applied previously with great success in the search for t -designs.

Keywords. Two-weight codes, Strongly regular graphs, Codes over rings.