On some periodic Golay pairs and pairwise balanced designs

Andrea švob

Department of Mathematics, University of Rijeka, Croatia

asvob@math.uniri.hr

Dean Crnković

Department of Mathematics, University of Rijeka, Croatia

deanc@math.uniri.hr

Doris Dumičić Danilović

Department of Mathematics, University of Rijeka, Croatia

ddumicic@math.uniri.hr

Ronan Egan

School of Mathematics, Statistics and Applied Mathematics, National University of Ireland, Galway

ronan.egan@nuigalway.ie

In this talk we will show how a relationship between certain pairwise balanced designs with v points and periodic Golay pairs of length v can be useful to construct periodic Golay pairs. The talk is based on recent work [1] where we construct pairwise balanced designs with v points under specific block conditions having an assumed cyclic automorphism group, and using isomorph rejection which is compatible with equivalence of corresponding periodic Golay pairs, we complete a classification of periodic Golay pairs of length less than 40, up to equivalence. Further, we will show how we use similar tools to construct new periodic Golay pairs of lengths greater than 40 where classifications remain incomplete, and demonstrate that under some extra conditions on its automorphism group, a periodic Golay pair of length 90 do not exist.

[1] D. Crnković, D. Dumičić Danilović, R. Egan, A. Švob, Periodic Golay pairs and pairwise balanced designs, J. Algebraic Combin., to appear.