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Costas arrays and permutations with distinct difference property

Costas arrays arise in sonar and radar applications and they also closely related to a few other combinatorial designs. Originally an $m \times m$ *Costas array* is defined as an $m \times m$ permutation matrix (that is, a square matrix with precisely one 1 in each row and column and all other entries 0) for which all the vectors joining the pairs of 1's are distinct. It can also be defined in terms of a permutation such that each row in the difference triangle contains distinct entries. In this talk, I will discuss basic constructions of Costas arrays and a weaker notion of Costas arrays: permutations with distinct difference property (DDP permutations). In particular, I will address some issues related to a construction proposed by Batten and Sane in 2003 on DDP permutations.