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*On classes of periodic parametrized circulant complex Hadamard matrices*

This talk is about a novel concept of periodicity for classes of Parametrized Circulant Complex Hadamard (PCCH) matrices associated with solution components of cyclic  $n$ -roots. Examples of PCCH matrices of sizes  $n = 4, 8, 12, 16$  and  $18$  with different periods will be presented. Beside applications of CCH matrices in coding and quantum information, the number of PCCH matrices constructed by this method is an evidence to disprove the problematics (for corresponding versions of CHC) set forth by Teodor Banica, Ion Nechita and Jean-Mark Schlenker. As a result of a reformulated Theory and fundamental Theorems, a Combinatorial-Symbolic search algorithm will be used to construct associated PCCH matrix of size  $n = 4k$  for ( $k \in \mathbb{N}$ ). In order to fill some major gaps in derivation of real Hadamard matrices, the impact of this promising method that works very well will be discussed. Using scripts of Mathematica, the construction of PCCH matrix of size  $n = 1084$  will be demonstrated.