

1077-05-584

Andrzej K Brodzik* (abrodzik@mitre.org), The MITRE Corporation, 202 Burlington Road, Bedford, MA 01730. *Design of radar and communication signals with perfect correlation properties.*

Finite chirps are critical in applications such as multi-user radar and sonar, spread spectrum communications, cryptography, and watermarking. In this work, subsets of finite chirps of length equal to square of a prime are examined. The investigation leads to a new, Zak space construction of general polyphase sequence sets with optimal correlation properties, known as perfect sequence sets. The entire collection of perfect sequence sets is given by a partition of the set of perfect auto correlation sequences, obtained by right coset decomposition of the group of all permutations with respect to a certain cyclic group. The construction suggests several further generalizations that can be obtained by operating exclusively on subgroups of the permutation group. (Received September 07, 2011)