

ABSTRACT

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Symmetry and Waveform Design

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We will describe how Heisenberg-Weyl groups appear in the construction of phase coded radar waveforms, in the design of spreading sequences in wireless communications, and in the theory of classical and quantum error-correcting codes. Interesting examples include the first and second order Reed-Muller codes, the binary and quaternary Kerdock codes, and the Welton and other Golay complementary sequences. These talks will focus on sequences contained in orthonormal bases fixed by maximal abelian subgroups of the Heisenberg-Weyl group. We will describe how the correlation properties of sequences in these orthonormal bases are determined by the symmetry group of the basis in the Heisenberg-Weyl group.