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Polyphase equiangular tight frames

Abstract

An equiangular tight frame (ETF) is a type of optimal packing of lines in a finite-dimensional Hilbert space. ETFs arise in various applications, such as waveform design for wireless communication, compressed sensing, quantum information theory and algebraic coding theory. In a recent paper, signature matrices of ETFs were constructed from abelian distance regular covers of complete graphs. We extend this work, constructing a new infinite family of complex ETFs. Our approach involves designing matrices whose entries are polynomials over a finite abelian group, namely polyphase matrices of finite filter banks.

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