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Optimality beyond the Welch bound: orthoplectic Grassmannian frames as weighted complex projective 2-designs

Abstract

Despite being pursued with a lot of dedication in frame theory and quantum information theory, maximal equiangular tight frames have only been confirmed to exist for lowest dimensions. This is especially puzzling since maximal sets of mutually unbiased bases, which are also known to be optimal packings but have a slightly larger number of vectors, are known to exist in complex Hilbert spaces of any prime power dimension. This talk presents a method by which we can construct a set of $M^2 + 1$ vectors in M complex dimensions that form a tight complex orthoplectic Grassmannian frame that is in addition related to a weighted complex projective 2-design with optimality properties for quantum state tomography.

Talk time: 2016-07-18 3:00PM— 2016-07-18 3:20PM
Talk location: Crow 204

Special Session: Applied harmonic analysis, frame theory, and operator theory. Organized by G. Kutyniok.