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Four-points symbolic semidefinite programming bounds for equiangular lines

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Abstract

We offer an alternative three-points semidefinite programming formula for spherical codes and spherical s-distance sets, as well as its multi-points generalization. The alternative formulas would be simpler when applying on spherical s-distance sets. Furthermore, we use the four-points semidefinite programming method symbolically to improve the upper bounds on the cardinality of equiangular lines in $\mathbb{R}^n$. Our results improve the bounds for infinitely many dimensions n with described angles.