Semidefinite programming bounds for codes and anticodes in Cayley graphs

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Many, often notoriously difficult, packing problems in combinatorics and geometry can be formulated as coding or anticoding problems in Cayley graphs. Examples include k-intersecting families of permutations, sets in n-dimensional Euclidean space avoiding the unit distance, or packings of congruent copies of a convex and compact body in Euclidean space. The best known upper bounds for the optimal packing density come in many cases from a uniform spectral technique. In the talk I will discuss this approach which uses semidefinite programming and harmonic analysis. I show how to compute the bounds and present some results.