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Optimality of spherical codes subject to symmetries. Preliminary report.

A spherical code is a finite subset of the sphere, and when studying spherical codes one is typically interested in finding codes maximizing the minimum distance between two distinct points. One of the most successful approaches to this problem is to generalize to spherical codes minimizing a potential function, and to apply linear programming bounds to this generalization. In some cases these bounds are sharp, which allows for proofs of optimality. In this work we consider spherical codes possessing certain symmetry groups, including the binary tetrahedral group and s -fold rotation. We will develop linear programming bounds in this setting and use them to prove some new optimality results for codes subject to imposed symmetries. (Received September 22, 2011)