

Bounding energies and cardinalities of spherical codes with inner products in a prescribed interval

Maya Stoyanova

Sofia University, Bulgaria

We develop a framework for obtaining linear programming bounds for the energy of spherical codes of given cardinality whose inner products belong to a prescribed subinterval of  $[-1, 1)$ . Our bounds are *universal* for several reasons – we provide a unified derivation, and the validity of the bounds holds for a wide range of codes and potential functions. For a common class of parameters we show that our bounds are in a certain sense optimal. We emphasize and utilize the deep connections between the problems of lower bounding energy and of upper bounding the size of codes.

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