

# On a duality in computing bounds for spherical codes

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## **Abstract**

We introduce and discuss a duality in computation of universal lower bounds for potential energy and universal upper bounds for cardinality of spherical codes. The gluing point is ensured by a kind of quadrature formulas first applied in the field by Levenshtein. In one direction, we show how a program, called SCOD, which was developed for obtaining linear programming (LP) bounds for spherical codes of prescribed dimension and minimum distance can be updated and utilized to produce data for obtaining good LP bounds for energy of spherical codes of prescribed dimension and cardinality and for fixed potential function which is absolute monotone. Dually in a sense, we show how recent advance in bounding energies can serve data for obtaining good LP bounds for maximal codes.

This is joint work with P. Dragnev, D. Hardin, P. Kazakov, E. Saff, M. Stoyanova.