1154-41-1560 **Douglas P Hardin*** (doug.hardin@vanderbilt.edu), Department of Mathematics, Vanderbilt University, Nashville, TN 37240, and **Peter Boyvalenkov**, **Peter Dragnev**, **Edward Saff** and **Maya Stoyanova**. *Linear programming bounds for packing and energy on the sphere.*

For a potential h defined on $[-1, 1)$ and a finite point configuration (or *code*) C on the unit sphere $\mathbb{S}^{n-1}$, the h-energy of C is given by

$$E(C, n, h) := \sum_{x \neq y \in C} h(\langle x, y \rangle).$$

In this talk, I will review classical linear programming bounds for spherical codes and present new 'universal' lower bounds for energy of the form

$$E(C, n, h) \geq N^2 \sum_{i=1}^{m} \rho_i h(\alpha_i),$$

where the nodes $\{\alpha_i\}$ and weights $\{\rho_i\}$ depend only on the cardinality N and dimension n and are obtained from a quadrature rule framework developed by Levenshtein in relation to maximal codes. These bounds coincide with those of Cohn and Kumar for the case of sharp codes. This is joint work with P. Boyvalenkov, P. Dragnev, E. Saff and M. Stoyanova. (Received September 16, 2019)