1154-05-1417 **Oleg R Musin*** (`oleg.musin@utrgv.edu`), One West University Boulevard, Mathematics, UTRGV, Brownsville, TX 78520. *Majorization and energy on spheres.*

Let S be an arbitrary set and $\rho : S \times S \to \mathbb{R}$ be any symmetric function. Then for a given real function f and for any finite subset X of S can be defined the potential energy $E_f(X) := \sum_{x \neq y \in X} f(\rho(x, y))$.

Let $R_\rho(X)$ denote the set of all values $\rho(x, y)$, where $x \neq y$. The *majorization theorem* (Karamata's inequality) yields that if $R_\rho(X)$ majorizes $R_\rho(Y)$, $|X| = |Y|$, then $E_f(X) \leq E_f(Y)$ for any continuous convex monotonically non-increasing function f. Therefore, if $M(S, \rho, n)$ denote the set of all $X \subset S$ with $|X| = n$ such that for any $Y \subset S$, $|Y| = n$, either r $R_\rho(X)$ majorizes $R_\rho(Y)$ or they are incomparable, then $M(S, \rho, n)$ consists of all X that give minimum energy of E_f for certain f.

In this paper we discuss $M = M(S, \rho, n)$ with $S = \mathbb{S}^d$. In particular, we describe M with $n \leq 4$, consider ρ such that $M(\mathbb{S}^d, \rho, d + 2)$ consists of regular simplices and their relations to universally optimal spherical configurations. (Received September 15, 2019)