

POSITIVE-DEFINITE FUNCTIONS ON SPHERES AND SIDELNIKOV INEQUALITY

N. O. KOTELINA AND A. B. PEVNYI

Abstract. This article is devoted to the new proof of V. M. Sidelnikov inequality (1974). The proof is based on the theory of positive-definite functions on spheres introduced and studied by I. Schoenberg (1942).

Mathematics subject classification (2010): 42A82.

Keywords and phrases: Positive-definite functions on spheres, Gegenbauer polynomials, Sidelnikov inequality.

REFERENCES

- [1] J. M. GOETHALS, J. J. SEIDEL, *Spherical designs*, Proc. Symp. Pure Math. A.M.S., **34**, (1979), 255–272.
- [2] N. O. KOTELINA, A. B. PEVNYI, *Extremal properties of spherical semidesigns*, St. Petersburg Math. J., **22**, 5 (2011), 795–801.
- [3] N. O. KOTELINA, A. B. PEVNYI, *Sidelnikov inequality*, St. Petersburg Math. J., **26**, 2 (2015), 351–356.
- [4] I. J. SCHOENBERG, *Metric spaces and positive definite functions*, Trans. Amer. Math. Soc., **44** (1938), 522–536.
- [5] I. J. SCHOENBERG, *Positive definite functions on spheres*, Duke Math. J., **9**, 1 (1942), 96–108.
- [6] V. M. SIDEL'NIKOV, *New bounds for densest packing of spheres in nn -dimensional Euclidean space*, Math. USSR-Sb., **24:1** (1974), 147–157.
- [7] B. VENKOV, *Réseaux et designs sphériques*, Réseaux Euclidiens, Designs sphériques et Formes Modulaires, L'Enseignement mathématique Monograph, Genève, 37 (2001), 10–86.