

**ALGORITHMS FOR THE CONSTRUCTION OF AN OPTIMAL COVER FOR SETS IN THREE-DIMENSIONAL EUCLIDEAN SPACE**

Received April 10, 2015

**V. N. Ushakov, P. D. Lebedev**

The problem of an optimal cover of sets in three-dimensional Euclidian space by the union of a fixed number of equal balls, where the optimality criterion is the radius of the balls, is studied. Analytical and numerical algorithms based on the division of a set into Dirichlet domains and finding their Chebyshev centers are suggested for this problem. Stochastic iterative procedures are used. Bounds for the asymptotics of the radii of the balls as their number tends to infinity are obtained. The simulation of several examples is performed and their visualization is presented.

Keywords: Hausdorff deviation, best  $n$ -net, ball cover, Chebyshev center.

*V.N. Ushakov*, RAS Corresponding Member, Krasovskii Institute of Mathematics and Mechanics, Ural Branch of the Russian Academy of Sciences, Yekaterinburg, 620990 Russia; Ural Federal University, Yekaterinburg, 620002 Russia, e-mail: ushak@imm.uran.ru .

*P.D. Lebedev*, Cand. Sci. (Phys.-Math.), Krasovskii Institute of Mathematics and Mechanics, Ural Branch of the Russian Academy of Sciences, Yekaterinburg, 620990 Russia, e-mail: pleb@yandex.ru .

Cite this article as:

V. N. Ushakov, P. D. Lebedev. Algorithms for the construction of an optimal cover for sets in three-dimensional Euclidean space, *Trudy Inst. Mat. Mekh. UrO RAN*, 2015, vol. 21, no. 2, pp. 276–288.