Generalization of Crofton formula

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The problems related to integral geometry and convex analysis are considered in this paper. Generalization of Crofton formula is considered for three-dimensional space in detail.

In the year 1880 J.J Silvester considered [1] the following modification of the classical Buffon's "Problem of the needle":

The Problem of Buffon-Silvester. N needles are fixed in the plane. Find the invariant measure of the sets of the lines which

a) meet at least of the needles;

b) meet all the needles.

This problem was in detail explored and decided for the two-dimensional case R.V. Ambartzumian [2].

Calculation of formula invariant measure is obtained for some convex sets [3].

In the year 1987 Yu. B. Zelinskii introduced concept (n-1)-convex sets [4].

This concept gives us algorithm solution the following problem [5-6].

In this work the author also consider the systems polyhedral (n-1)-convex sets.

Theorem 1. Let be $\mathbf{B_1}$ and $\mathbf{B_2}$ two tetrahedrons with a side **a** , **d** - distance between $\mathbf{B_1}$ and $\mathbf{B_2}$. $\mathbf{C_1}$ - center of symmetry $\mathbf{B_1}$, $\mathbf{T_1}$ - octahedron with a side **a,** **d** - distance between $\mathbf{C_1}$ and $\mathbf{T_1}$. $\mathbf{C_2}$ - center of symmetry tetrahedron $\mathbf{B_2}$ and octahedron $\mathbf{T_1}$.

Then invariant measure of the sets of the planes which separate $\mathbf{B_1}$ and $\mathbf{B_2}$ is equal invariant measure of the sets of the planes which separate point $\mathbf{C_1}$ and octahedron $\mathbf{T_1}$.

Proof follows from theorem 1 [5].

Properties (n-1)-convex sets are used for the calculation of invariant measures on set of polyhedrons. Offered method and got results of calculations, enable to find invariant measures at the decision of direct and reverse task of tomography.

References

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