

INTERNATIONAL BIWEEKLY ONLINE SEMINAR ON ANALYSIS, DIFFERENTIAL EQUATIONS AND MATHEMATICAL PHYSICS

Coordinators: Prof. Alexey Karapetyants, Prof. Vladislav Kravchenko

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Distance between two subsets of a unit-volume convex body

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In multidimensional spaces we observe a variety of different phenomenas. Some of them might seem strange, for example, the volume of an n -dimensional ball of radius 2022 goes to 0 as n tends to ∞ . Even though two points in the n -dimensional unit cube could be at a distance of \sqrt{n} , two subsets of volume ε could not be too far from each other - the distance between them is bounded above by $C \cdot \sqrt{|\ln(\varepsilon)|}$ for some constant C independent of ε and n . For standard simplexes and hyperoctahedrons (multidimensional octahedrons) we should replace $C \cdot \sqrt{|\ln(\varepsilon)|}$ with $C \cdot |\ln(\varepsilon)|$.

In our approach the key role is played by the isoperimetric problem: what is the minimal surface area that a body of a certain volume could have? (This problem could be considered in various different settings, for example, in the space R^n , on the surface a sphere, in the space R^n with gaussian measure, or in a cube $(0; 1)^n$.)

*Seminar website: <https://msrn.sfedu.ru/sl>. The seminar uses Microsoft Teams online platform.

Please send questions to ademp.seminar@gmail.com (Tatiana Andreeva, scientific secretary).

The seminar is organized by the coordinators Alexey Karapetyants and Vladislav Kravchenko within the activities of the Regional Mathematical Center of the Southern Federal University in collaboration with Institute of Mathematics, Mechanics and Computer Sciences of the Southern Federal University and the OTHA research group in Operator Theory and Harmonic Analysis.

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