



International
Scientific Conference



Algebraic and Geometric Methods of Analysis



Devoted to 160 anniversary of
Dvytro Grave
(25.08.1863 - 19.12.1939)
Academician of the Ukrainian
Academy of Sciences, the
first director of the Institute of
Mathematics of NAS of Ukraine

May 29 – June 1, 2023
Odesa, Ukraine

LIST OF TOPICS

- Algebraic methods in geometry
- Differential geometry in the large
- Geometry and topology of differentiable manifolds
- General and algebraic topology
- Dynamical systems and their applications
- Geometric and topological methods in natural sciences
- Geometric problems in mathematical analysis

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Invariant $*$ -measures

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A triangular norm is a binary operation $*$ on $[0, 1]$ which is associative, commutative, monotone (i.e. $a \leq b, c \leq d$ together imply $a * c \leq b * d$), and 1 is the neutral element. In [1] the notion of $*$ -measure is introduced. Given a compact Hausdorff space X , we define a $*$ -measure on X as a functional $\mu: C(X, [0, 1]) \rightarrow [0, 1]$ satisfying: $\mu(c) = c$ for arbitrary $c \in [0, 1]$; $\mu(\max\{\varphi, \psi\}) = \max\{\mu(\varphi), \mu(\psi)\}$ for all $\varphi, \psi: X \rightarrow [0, 1]$; $\mu(\lambda * \varphi) = \lambda * \varphi$ for all $\lambda \in [0, 1]$ and $\varphi \in C(X, [0, 1])$. It is proved in [1] that the weak* topology on the set $I^*(X)$ of all $*$ -measures on X makes it a compact Hausdorff space and determines a functor in the category of compact Hausdorff spaces.

Given a system of self maps $\{f_1, \dots, f_n\}$ on a compact metrizable space X and a $*$ -measure on $\{1, \dots, n\}$, in a standard way one can define an analog of the Hutchinson-Barnsley operator for $*$ -measures and the notion of invariant $*$ -measure on X .

The talk is devoted to the question of existence of invariant $*$ -measures.

Our results are in the spirit of [2] and [3] (ultrametric case). Also, in the case of metric space X , one can define a metric on the space of all $*$ -measures which is a modification of a metric from [4] (in turn, the latter is a version of Bazylevych-Repovš-Zarichnyi metric [5]). This metric allows us to apply the Banach Contraction Principle to the problem of existence of invariant $*$ -measures.

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