

International
Online Conference



**Algebraic
and Geometric
Methods of Analysis**

dedicate to the memory
of Yuriy Trokhymchuk
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LIST OF TOPICS

- Topological methods in analysis
- Geometric problems of complex and mathematical analysis
- Algebraic methods in geometry
- Differential geometry in the whole
- Geometry and topology of differentiable manifolds
- General and algebraic topology
- Geometric and topological methods in natural sciences

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Some generalizations of the known theorems of the type of geodesical unique definability

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The realized in [1] broadening to the noncompact but complete spaces of affine connection the well-known Hopf-Bochner-Uano techniques ([3], for example) on the grounding the so called vanishing theorems allowed to broad to the corresponding spaces some well-known theorems of the type of geodesical unique definability ([2], for example). In particular, it is grounded that the next theorems take place.

Theorem 1. *Complete connected noncompact Riemannian C^r -space V^n ($n > 2$, $r > 4$) with the positive defined metric tensor and the Einstein tensor that doesn't equal to zero identically, that satisfies the recurrence conditions*

$$T_{ijkl,mh}^{(\alpha\beta)} g^{mj} g^{hl} E_{..}^{ik} = T_{ijkl}^{(\alpha\beta)} W^{ijkl} + \frac{1}{n} T_{ijkl}^{(\gamma j)} R_{\gamma \cdot \cdot}^{(\alpha|\cdot|\beta)} E_{..}^{ik} - \frac{1}{n} T_{ijkl}^{(\alpha j)} R_{..}^{\beta l} E_{..}^{ik} - \frac{1}{n} T_{ijkl}^{(\beta j)} R_{..}^{\alpha l} E_{..}^{ik} + T_{ijkl,m}^{(\alpha\beta)} W^{ijklm},$$

where

$$T_{ijkl}^{\alpha\beta} = n \left(\delta_j^\beta R_{ikl}^\alpha - \delta_k^\beta R_{lji}^\alpha \right) - g_{ik} \left(\delta_j^\beta R_l^\alpha - R_{jl}^\alpha \cdot^\beta \right) + g_{jl} \left(\delta_k^\beta R_i^\alpha - R_{ki}^\alpha \cdot^\beta \right),$$

”, ” means the corresponding covariant differentiation, doesn't admit non-trivial (different from the affine) geodesic mappings in the large.

Theorem 2. *Complete connected noncompact Riemannian C^r -space V^n ($n > 2$, $r > 4$) with the positive defined metric tensor and the Einstein tensor that doesn't equal to zero identically, that satisfies the recurrence conditions*

$$P_{ij,kh}^{(\alpha\beta)} g^{hi} E_{..}^{kj} = P_{ij,k}^{(\alpha\beta)} W^{ijk} + P_{ij}^{(\alpha\beta)} W^{ij},$$

where

$$P_{ij}^{\alpha\beta} = \delta_i^\beta R_j^\alpha - \delta_j^\beta R_i^\alpha,$$

W^{ij} and W^{ijk} are some arbitrary tensors, correspondingly of the second and the third valence, doesn't admit non-trivial (different from the affine) geodesic mappings in the large.

Examples of the corresponding spaces are given.

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