

International scientific conference
«Algebraic and geometric methods
of analysis»

Book of abstracts



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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 problems in mathematical analysis
- Geometric and topological methods in natural sciences
- History and methodology of teaching in mathematics

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НТБ ОНАФТ

Polyadic topology on Z and linear differential equations in the ring $Z[[x]]$

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Let $Z[[x]]$ be a ring of formal power series with integer coefficients. On Z we consider the polyadic topology (see [1], Ch.III, section 3.5 and [2]) and on $Z[[x]]$ we consider the topology of coefficientwise convergence (see [3], Ch.1, section 0.4).

Let $b \in Z$ and $f(x) \in Z[[x]]$. A question on solutions of the following implicit linear nonhomogeneous differential equation $by' + f(x) = y$ in the ring $Z[[x]]$ is studied. The next main results are obtained.

1. The equation $y' + 1 + x + x^2 + \dots = y$ has no a solution as a power series with integer coefficients.
2. By the concept of the polyadic sum of integers (see [1], Ch.III, section 3.5), a necessary and sufficient condition for the existence of a solution of the differential equation $by'(x) + f(x) = y(x)$ as a power series with integer coefficients was found.
3. If the equation $by'(x) + f(x) = y(x)$ has a solution $y(x)$ from $Z[[x]]$ then

$$y(x) = f(x) + bf'(x) + b^2 f''(x) + \dots,$$

and this series converges in the topology of coefficient-wise convergence.

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Antoniouk O., Maksymenko S. <i>Contractibility of manifolds by means of stochastic flows</i>	35
Ayatollah Zadeh Shirazi F. <i>More about set-theoretical entropies in generalized shifts</i>	36
Ayatollah Zadeh Shirazi F., Nili Ahmadabadi Z. <i>A comparative study on dynamical properties of Fort, Fortissimo and Arens-Fort transformation groups</i>	37
Babych V. <i>Construction and topological properties of the closed extension topology</i>	38
Balan V., Cipu C., Măgureanu M. <i>Tuning role of surface slices within urbanism-index fuzzy system hypersurfaces</i>	40
Bakhtadze Sh. <i>On the Chogoshvili's spectral homology theory of the second family</i>	42
Banaru M. B., Banaru G. A. <i>On almost contact metric hypersurfaces in special Hermitian manifolds</i>	43
Bardyla S. <i>On a semitopological α-bicyclic semigroup</i>	45
Batkhin A. B. <i>Some applications of the discriminant and resonance sets of a real polynomial</i>	46
Beshimov R. B., Mukhamadiev F. G. <i>Some cardinal and topological properties of N_T^φ-kernel of a topological space X and superextensions</i>	48
Bilet V., Dovgoshey O. <i>Finiteness of pretangent spaces at infinity</i>	50
Bonacci E. <i>A new method in geometry from a germinal approach to power sums</i>	52
Denega I. <i>Estimates of products of inner radii of non-overlapping domains in the complex plane</i>	53
Dovgoshey O., Petrov E., Teichert H.-M. <i>Some extremal and structural properties of finite ultrametric spaces</i>	55
Ertem Ü. <i>Twistors, harmonic spinors and symmetry operators</i>	57
Gao J. <i>The geometry of Banach space and fixed point of non-expansive mapping</i>	59
Glazunov N. <i>Artin-Schreier coverings, Galois representations and density Sato-Tate distribution functions</i>	60
Gunduz Aras C., Bayramov S. <i>Some Separation Axioms in Supra Soft Topological Spaces</i>	62
Hentosh O. Ye., Prykaratsky Ya. A., Prykarpatski A. K. <i>The differential-geometric and algebraic aspects of the Lax-Sato theory</i>	63
Herasymov V., Gefter S. <i>Polyadic topology on Z and linear differential equations in the ring $Z[[x]]$</i>	65
Hladysh B. I., Prishlyak A. O. <i>Deformation of a Morse function on a surface with the boundary</i>	66
Incesu M., Gursoy O. <i>The similarity invariants of integral B-splines</i>	68
Khesin B. <i>Geometry and integrability of pentagram maps</i>	69
Klishchuk B., Salimov R. <i>The extremal problem for the area of an image of a disc</i>	70