

International scientific conference
«Algebraic and geometric methods
of analysis»

Book of abstracts



May 31 - June 5, 2017
Odessa
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 problems in mathematical analysis
- Geometric and topological methods in natural sciences
- History and methodology of teaching in mathematics

ORGANIZERS

- The Ministry of Education and Science of Ukraine
- Odesa National Academy of Food Technologies
- The Institute of Mathematics of the National Academy of Sciences of Ukraine
- Taras Shevchenko National University of Kyiv
- The International Geometry Center

PROGRAM COMMITTEE

Chairman: Prishlyak A. (<i>Kyiv, Ukraine</i>)	Maksymenko S. (<i>Kyiv, Ukraine</i>)	Rahula M. (<i>Tartu, Estonia</i>)
Balan V. (<i>Bucharest, Romania</i>)	Matsumoto K. (<i>Yamagata, Japan</i>)	Sabitov I. (<i>Moscow, Russia</i>)
Banakh T. (<i>Lviv, Ukraine</i>)	Mashkov O. (<i>Kyiv, Ukraine</i>)	Savchenko A. (<i>Kherson, Ukraine</i>)
Fedchenko Yu. (<i>Odesa, Ukraine</i>)	Mykytyuk I. (<i>Lviv, Ukraine</i>)	Sergeeva A. (<i>Odesa, Ukraine</i>)
Fomenko A. (<i>Moscow, Russia</i>)	Milka A. (<i>Kharkiv, Ukraine</i>)	Strikha M. (<i>Kyiv, Ukraine</i>)
Fomenko V. (<i>Taganrog, Russia</i>)	Mikesh J. (<i>Olomouc, Czech Republic</i>)	Shvets V. (<i>Odesa, Ukraine</i>)
Glushkov A. (<i>Odesa, Ukraine</i>)	Mormul P. (<i>Warsaw, Poland</i>)	Shelekhov A. (<i>Tver, Russia</i>)
Haddad M. (<i>Wadi al-Nasara, Syria</i>)	Moskaliuk S. (<i>Wien, Austria</i>)	Shurygin V. (<i>Kazan, Russia</i>)
Herega A. (<i>Odesa, Ukraine</i>)	Panzhenskiy V. (<i>Penza, Russia</i>)	Vlasenko I. (<i>Kyiv, Ukraine</i>)
Khruslov E. (<i>Kharkiv, Ukraine</i>)	Pastur L. (<i>Kharkiv, Ukraine</i>)	Zadorozhnyj V. (<i>Odesa, Ukraine</i>)
Kirichenko V. (<i>Moscow, Russia</i>)	Plachta L. (<i>Krakov, Poland</i>)	Zarichnyi M. (<i>Lviv, Ukraine</i>)
Kirillov V. (<i>Odesa, Ukraine</i>)	Pokas S. (<i>Odesa, Ukraine</i>)	Zelinskiy Y. (<i>Kyiv, Ukraine</i>)
Konovenko N. (<i>Odesa, Ukraine</i>)	Polulyakh E. (<i>Kyiv, Ukraine</i>)	

ADMINISTRATIVE COMMITTEE

- Egorov B., chairman, rector of the ONAFT;
- Povarova N., deputy chairman, Pro-rector for scientific work of the ONAFT;
- Mardar M., Pro-rector for scientific-pedagogical work and international communications of the ONAFT;
- Fedosov S., Director of the International Cooperation Center of the ONAFT;
- Volkov V., Director of the Educational Research Institute of Mechanics, Automation and Computer Systems named after P. M. Platonov;
- Bukaros A., Dean of the Faculty of automation, mechatronics and robotics

ORGANIZING COMMITTEE

Kirillov V.
Konovenko N.
Fedchenko Yu.

Hladysh B.
Nuzhnaya N.
Osadchuk E.

Maksymenko S.
Khudenko N.
Cherevko E.

НТБ ОНАФТ

Morse-Smale flows on torus with hole

Aleksandr Prishlyak

(Taras Shevchenko National University of Kiev, Ukraine)

E-mail: prishlyak@yahoo.com

Andrey Prus

(Taras Shevchenko National University of Kiev, Ukraine)

E-mail: andrei.prus@mail.ru

We consider the Morse-Smale flows. Let consider the torus with a hole and Morse-Smale flows [1] on it. Similarly Morse-Smale flows on closed surfaces those flows also are structurally stable and form an open everywhere dense set of all flows on the surface with boundary [2] .

For a torus with hole there exist two separatrices, cutting through which we obtain a simply connected domain. Boundary of this area can be viewed as a circle containing this separatrix. Others separatrices can be considered as the chords on the circle.

Describe the process of transformation diagrams

Diagram can cut along a chord, obtained curvilinear polygons can glue along one pair of separatrices on the circle. Obtained curvilinear polygon again can be considered as chord diagram.

Two diagrams are called equal if one of them can be obtained from another by rotation or symmetry and called equivalent if one of them can be obtained from another by a process of transformation diagrams.

Theorem 1. *Two Morse-Smale flows are equivalent iff their diagrams are equivalent.*

For torus with hole and with 8 singular points(on the boundary) we obtained a set of 106 possible diagrams, but it was found that a large number of diagrams are equivalent. As a result, we obtained 18 equivalence classes hence we counted the number of topological non-equivalent Morse-Smale flows on this surface.

REREFENCES

- [1] M.J Pacifico. *Stability of Morse-Smale vector fields on manifolds with boundary* Journal of Differential Equations 54(3):346-372 · September 1984.
- [2] Jacob Palis Jr., Welington de Melo *Genericity and Stability of Morse-Smale Vector Fields* Geometric Theory of Dynamical Systems ISBN 978-1-4612-5703-5

Konovenko N., Lychagin V. <i>On projective classes of rational functions</i>	71
Kozerenko S. <i>Orientations of trees and signed Markov graphs</i>	73
Kuzmenko T. <i>Constructive description of G-monogenic mappings in the algebra of complex quaternions</i>	74
Lyubashenko V. <i>Moyal and Rankin-Cohen deformations of algebras</i>	76
Markitan V. <i>Fractal properties of sets associated with Markov representation of real numbers defined by a double stochastic matrix</i>	78
Matsumoto K. <i>Warped product semi-slant submanifolds in locally conformal Kaehler manifolds</i>	79
Mormul P. <i>Weak and strong nilpotentizability in the monster towers hosting flag distributions</i>	80
Mukhamadiev F. G. <i>The local density and the local weak density of $N_7^{\mathcal{O}}$-kernel of a topological space X and superextensions</i>	82
Muradoglu Z., Gunduz Aras C. <i>A study for decision making problems by using interval soft sets</i>	84
Muradov R. S. <i>Archimedean copula functions and their some algebraic properties with applications</i>	85
Obikhod T. V. <i>BPS states of Fourfolds as candidates for Kaluza-Klein modes</i>	87
Parasyuk I. O. <i>Landau-type inequalities for curves on Riemannian manifolds</i>	88
Prislyak A., Prus A. <i>Morse-Smale flows on torus with hole</i>	90
Reinov O. <i>On nuclear operators with trace $V = 1$ and $V^2 = 0$</i>	91
Sabitov I. Kh. <i>Multiple roots of the volume polynomials for polyhedra</i>	92
Samokhvalov S. <i>Theory of gravity in the affine frame</i>	93
Shamolin M. V. <i>Integrable systems with dissipation on the tangent bundle of two-dimensional manifold</i>	94
Turhan T., Ayyildiz N. <i>On geometry of spatial kinematics in Lorentzian space</i>	96
Turhan T., Ayyildiz N. <i>A study on the integral invariants of a closed spacelike ruled surface</i>	97
Vasilchenko A. N. <i>Dual modules over Steenrod algebra 2</i>	98
Vlasenko I. <i>Topology of the basin of attraction of surface endomorphisms.</i>	100
Voloshyna V. <i>About some properties of functions determined as transformations from W^n to W^m-representation</i>	101
Vyhivska L. <i>On the problem of product of inner radii symmetric non-overlapping domains</i>	103
Yildirim S., Ayyildiz N. <i>A Study on Rectifying Curves in Semi-Euclidean Spaces</i>	104
Арсеньева О. Е., Кириченко В. Ф., Суровцева Е. В. <i>Эрмитова геометрия почти контактного метрического многообразия</i>	105