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«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

BPS states of Fourfolds as candidates for Kaluza-Klein modes

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Within the framework of the cosmological theory of the Big Bang, F-theory is represented that unifies all four types of fundamental interactions [1]. Among the most exciting predictions of physics beyond the Standard Model is the assumption of the space of extra dimensions [2] that solves the problem of the hierarchy of interactions. With the presence of this extra dimensions are connected the searches for Kaluza-Klein (KK) partners of gravitons, gauge bosons and microscopic black holes at the Large Hadron Collider (LHC). The theoretical models of the space of extra dimensions are models of Arkani-Hamed, Dimopoulos and Dvali and of Randall, Sundrum. In the framework of F-theory is considered the fourfold [3], as a space of extra dimensions, the choice of which is dictated by the "good" group of holonomy. We study the duality between the F-theory compactified on the K3-surface and $E8 \times E8$ heterotic string compactified on the torus T^2 . The set of BPS states corresponding to the Calabi-Yau fourfolds, which has either an elliptic curve or a K3-fibration as a layer, is studied in the aspect of correspondence to the KK modes of the M-theory on $R^8 \times (S^1 \times S^1 = T^2) \times S^1/Z_2$ [4]. The singularities of the moduli space of the Calabi-Yau fourfold make it possible to observe massive KK modes [5], the masses of which are obtained from the M-theory of supergravity. The result is of interest for a theoretical understanding of the KK modes, the experimental searches for which are carried out at the LHC [6].

REREFENCES

- [1] Cumrun Vafa. Evidence for F-theory. *Nucl. Phys.*, B469: 403–418, 1996.
- [2] Yuri A. Kubyshin. Models with Extra Dimensions and Their Phenomenology. arXiv:hep-ph/0111027v2.
- [3] 3. A. Klemm, B. Lian, S-S. Roan and S-T. Yau. Calabi-Yau fourfolds for M- and F-Theory compactifications. hep-th/9609239.
- [4] 4. Petr Horava, Edward Witten. Heterotic and Type I string dynamics from eleven dimensions. *Nucl. Phys.*, B460: 506–524, 1996.
- [5] Albrecht Klemm, Peter Mayr and Cumrun Vafa. BPS States of Exceptional Non-Critical Strings. hep-th/9607139.
- [6] Lisa Randall. Extra Dimensions and Warped Geometries. *Science*, 296 (5572): 1422–1427, 2002.

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