Mathematical Physics Seminars in ITEP

This volume contains proceedings of seminars of the Mathematical Physics Group of the Institute for Theoretical and Experimental Physics. From its initiation by Alexei Morozov in 1990, the Math.Physical Group remains to be an original research center and an important place of collaboration between physists and mathematicians. This volume is the second such collection published by the American Mathematical Society, the first one is

Morozov, A.Yu, Olshanetsky, M.A. *Moscow seminar in Mathematicals Physics*, AMS, Providence, 1999.

Papers of this collections are concerned with some mathematical topics that were affected strong influence of modern physics. Their subjects are quite diverse. We hope however this choice would reflect the variety of motives the ITEP seminar in mathematical physics has been known and has been attended by an even larger variety of participants. We are glad to use this opportunity to cordially thank all who participated in our seminars.

Let us give a brief description of the papers in this volume.

The subject of the work of Boris Feigin, Anatol Kirillov, and Sergei Loktev is 'Weyl modules' over the algebras of polynomial currents in two variables.

The paper of Vladimir Fock shows how many aspects of 2-dimemsional geometry come to one's mind by looking at the cosh-Gordon equation (when one looks).

Benjamin Enriques and Vladimir Rubtsov construct an explicit parametrization of the moduli space of 2-dimensional vector bundles over an algebraic curve and apply it to the Hitchin and Knizhnik–Zamolodchikov–Bernard systems, and Beilinson–Drinfeld operators.

The work of Anton Gerasimov, Sergei Kharchov, Dmitry Lebedev, and Sergei Oblezin is devoted to a realization of one class of representations of Lie algebras and quantum groups based on Gelfand–Tsetlin schemes.

Alexei Gorodentsev, Anton Khoroshkin, and Alexei Rudakov investigate syzigies of flag manifolds from cohomologies of certain infinite-dimensional Lie superlagebras. Their approach allows them to compute the syzigies explicitely in some special cases.

The subject of the paper of Alexei Gorodentsev and Sergei Kuleshov is Harder–Narasimhan filtrations on categories.

The purpose of the paper of Dmitry Kaledin is to clarify the Gabber Theorem on the involutivity of the singular support of D-modules

The work of Sergei Khoroshkin and Stanislav Pakulyak is devoted to the Borel subalgebras in the quantum affine algebras and the method of Drinfeld projectors. They present also a survey of the subject.

The subject of the paper of Andrey Levin and Andrei Zotov is different forms of the Painleve VI equation.

In the first note of Yuri Neretin, it is constructed a canonical embedding of the space L^2 with respect to a determinantal point stochastic process (as the Dyson sine-process) to the fermionic Fock space.

In the second note, it is discussed a realization of the space of functions of a real variable as a space of distributions on the adelic product of all the p-adic fields.

Misha Verbitsky consider a certain class of hypercomplex manifolds and gives a criterion that the holonomy of a canonical torsion-free connection is contained in the quaternionic SL.

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