I.Vekua Institute of Applied Mathematics
of the Tbilisi State University

International Conference
on
Generalized Analytic Functions and their Applications

Program and Abstracts

12-14 September, 2011

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International Conference
on
Generalized analytic functions and their applications
Tbilisi, Georgia

12-14 September, 2011

September 12, Monday (10^{00}-18^{00})

Session's Chairman N.Kaldani

Gaiane Panina
Moduli spaces of polygonal linkages

We shall survey recent results obtained in cooperation with George Khimshiashvili, Mikhail Khristoforov, Dirk Siersma, Alena Zhukova.

Barsegian G.
On a principle in the theory of complex polynomials implying Gauss-Lucas theorem

A phenomenon for an arbitrary complex polynomial P is revealed showing that any cluster of zeros of P (even of very few zeros) attracts, in a sense, zeros of $P(k)$. The results imply Gauss-Lucas theorem and are closely connected with Crace-Heawood's theorem and Walsh's two circle theorem.

E. Gordadze
On the boundary value problem of linear conjugation with a piecewise continuous coefficient on Carleson curves

Coffee break
Discussion

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Boris A. Kats

The Cauchy transform and certain non-linear boundary value problem on non-rectifiable arc

G. Akhalaia and N. Manjavidze
Functional classes for generalized Beltrami systems

The functional classes of generalized analytic vectors for generalized Beltrami systems are introduced and investigated. Some properties of these classes which turned to be useful in order to solve the discontinuous boundary value problems are established.

V. Jikia
Dolbeaut's lemma for the functions of the class $L_p^{loc}(C), p > 2$

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September 13, Tuesday (10^{00}-18^{00})

Session's Chairman G.Makatsaria

G. Barsegian
On the aproximity property of meromorphic functions.
Initiating some novel studies in the complex analysis

The classical Nevanlinna theory (1920s) and Ahlfors theory (1935) describe numbers of a-points of meromorphic functions. These theories are considered as some culminations of numerous other studies related to the numbers of *a*-points of different classes of meromorphic functions. The next stage was obviously studying of geometric locations of these a-points. At the end of 1970s so called proximity (closeness) property of *a*-points of meromorphic functions has been established describing the locations of the *a*-points (instead of numbers merely). Moreover, it turned out that this property implies the key conclusions of Nevanlinna-Ahlfors theories. In the present paper we give a new simplified wording of this property.

N.Kaldani
Some properties of the generalized power functions

G.Giorgadze
Some properties of the space of generalized analytic functions

We consider the relationship between the holomorphic and conformal structures and the spaces of generalized analytic functions induced from conformal structures.

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B.Bojarski
On the Beltrami equation

We prove that the quasiregular mappings given by the (normalized) principal solution of the linear Beltrami equation (1) and the principal solution of the quasilinear Beltrami equation are inverse to each other. This basic fact is deduced from the Liouville theorem for generalized analytic functions. It essentially simplifies the known proofs of the measurable Riemann mapping theorem and its holomorphic dependence on parameters.

Buliskeria G.
The periodicity of the space of generalized analytic functions

We consider the spaces of generalized analytic functions -$\Omega(a,b), a, b \epsilon L_{p,2}$ and shown that this spaces as vector spaces on $\boldsymbol{R}$ have different structures.

G. A. Magomedov
About some quasilinear and nonlinear equations of Cauchy-Riemann and Beltrami types

We consider the problems of existence and representation of solutions of some quasilinear and nonlinear equations of Cauchy-Riemann and Beltrami types.

M. M. Sirazhudinov, S.P. Dzhamaludinova
On G-compactness of the classes of first and second order elliptic systems

Coffee break
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Session's Chairman G.Akhalaia

Vladimir V. Mityushev
R-linear and Riemann-Hilbert problems for multiply connected domains

Garuchava Sh.
On the Darboux transformation for Carleman-Bers-Vekua system

We used Darboux tranformation technique for investigation of stationary Schrodinder two-dimensional equation and s.c. main Vekua equation.

Khimshiashvili G.
Complex geometry of quadrilateral linkages

We present a number of observations on the complex geometry of quadrilateral linkages. In particular, we show that, for each configuration of a planar quadrilateral linkage *Q(a,b,c,d)* with pairwise distinct side-lengths *(a, b, c, d)*, the cross-ratio of its vertices belongs to the circle of radius *ac/bd* centered at point $1 \in C$.

Moreover, we establish an analog of Poncelet porism for the discrete dynamical system on the planar moduli space of 4-bar linkage defined by the product of diagonal involutions, and discuss some related issues suggested by a beautiful link to the theory of discrete integrable systems discovered by J.Duistermaat.

Finally, we establish a connection between certain extremal problems for configurations of *4*-bar linkage and tetrahedra obtained from its configurations using the famous Minkowski theorem on polyhedra with prescribed areas of faces.

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G. Makatsaria

Some properties of the irregular Elliptic Systems on the Plane

We prove, that the solutions of some singular elliptic systems have principally nonanalytic behavior in the neighborhood of fixed singular points.

V.A. Poberezhny

On isomonodromic deformations and integrability concerning linear systems of differential equations

We review the modern theory of isomonodromic deformations, considering linear systems of differential equations. On that background we illustrate the natural relations between such phenomena as integrability, isomonodromy and Painleve property. The recent advances in the theory of isomonodromic deformations we present show perfect agreement to that approach.

Rusishvili M.

On the Fuchsian systems free from accessory parameters

We consider a system of Fuchsian linear differential equations free from accessory parameters with 3 singular points and study monodromy groups of such systems.

Contact information:

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Main topics of the conference:

- **Functional analytic methods for first order elliptic systems on complex plane and Riemann surfaces;**
- **Boundary value problems for analytic and generalized analytic functions and vectors;**
- **Quasiconformal mappings;**
- **Fuchsian systems and holomorphic bundles on Riemann surfaces;**
- **Analytic differential equations in complex domain;**
- **Applications of generalized analytic functions in mathematical physics.**

Scientific Committee:

B.Bojarski - Chairman (Poland), G.Barsegian (Armenia), G.Giorgadze - Co-chairman (Georgia), G.Jaiani (Georgia), B.Katz (Russia), G.Khimshiashvili (Georgia), V.Mityushev (Poland)

Local Organizing Committee:

G. Akhalaia (Co-chairman), N.Avazashvili , G.Giorgadze (Chairman), V.Jikia, N.Kaldany, G.Makatsaria, N.Manjavidze (Secretary)