

III INTERNATIONAL CONFERENCE
ON ANALYTIC AND PROBABILISTIC NUMBER THEORY

PROCEEDINGS

Contents

1. G. Bareikis (Vilnius University), *Kubilius' method in the polynomial semigroup*, 7 pp.

Abstract

Using additive functions in the polynomial semigroups over finite fields, we define models of random processes and examine their weak convergence.

2. I. Belov (Institute of Mathematics and Informatics), *Some estimates for Dirichlet L -functions*, 7 pp.

Abstract

In the paper some estimates of metric kind for Dirichlet L - functions are obtained. Such estimates can be applied to prove limit theorems in the space of continuous functions.

3. E.-H. Choi (South-Korea, Chosun University), W. Schwarz (FRG, Frankfurt University), *Mean values of products of shifted arithmetical functions*, 11 pp.

Abstract

The authors compare formulae due to L. Lucht and Schwarz, evaluating mean values for the product $n \mapsto \tilde{F}_2(n) = \prod_{\kappa=1}^2 f_{\kappa}(n + \alpha_{\kappa})$ of aditively shifted [multiplicative] functions f_1, f_2 .

4. C. Doche, M. Mendes-France (France, Bordeaux University 1), *Real roots!*, 14 pp.

Abstract

This is a survey of the results on the number of real roots of a random polynomial. In this regard, we define MR (mimic randomness) sequences of real numbers and discuss the problem of their existence.

5. A. Dubickas (Vilnius University), *Sequences with infinitely many composite numbers*, 4 pp.

Abstract

Let θ be a Pisot number, and let $P(z)$ be a polynomial with integer coefficients whose leading coefficient is positive. We prove that the numbers $[P(n)\theta^n]$ are composite for infinitely many positive integers n .

6. R. Garunkštis (Vilnius University), J. Steuding (Frankfurt University), *Do Lerch zeta-functions satisfy the Lindelöf hypothesis?*, 15 pp.

Abstract

We study the order of growth, and the zero distribution of Lerch zeta-functions. We show that the analogue of the density hypothesis fails to be true for a positive proportion of all Lerch zeta-functions. Further, we discuss the analogue of the Lindelöf hypothesis for Lerch zeta-functions and its connection with certain exponential sums and the distribution of nontrivial zeros.

7. J. Ignatavičiūtė (Vilnius University), *Joint discrete value distribution of Lerch zeta-functions*, 8 pp.

Abstract

Joint discrete limit theorems for Lerch zeta-functions in the spaces of analytic and meromorphic functions are proved.

8. A. Ivić (Jugoslavia, Beograd University), *On the estimation of $Z_2(s)$* , 18 pp.

Abstract

Estimates for $Z_\epsilon(s) = \int_1^\infty |\zeta(\frac{1}{2} + ix)|^4 x^{-s} dx$ ($\Re s > 1$) are discussed, both pointwise and in the mean square. It is shown how these estimates can be used to bound the eighth moment of $|\zeta(\frac{1}{2} + it)|$ and $E_2(T)$, the error term in the asymptotic formula for $\int_0^T |\zeta(\frac{1}{2} + it)|^4 dt$.

9. A. Kačėnas, D. Šiaučiūnas (Vilnius University), *On the periodic zeta-function. III*, 11 pp.

Abstract

In the paper the weak convergence of probability measures defined by terms of periodic zeta-functions in functional spaces is considered. It continues the investigations of B.C. Berndt, L. Schoenfeld, M. Katsurada, S. Kanemitsu.

10. R. Kačinskaitė, A. Laurinčikas (Vilnius University), *A joint discrete limit theorem for the Matsumoto zeta-function in the space of meromorphic functions*, 9 pp.

Abstract

In the paper a limit discrete theorem in the sense of the weak convergence of probability measures for a collection of Matsumoto zeta-functions in the space of meromorphic functions is obtained.

11. C. Kliorys (USA, Gannon University), *Infinite sums, linear recurrences, and identities from algebraic units*, 7 pp.

Abstract

We study linear recurrences with methods from algebraic number theory and obtain explicit sums for appropriate infinite series. New combinatorial identities involving multinomial coefficients are derived in this way.

12. S.-Y. Koyama (Japan, Keio University), *Subconvexity of Hecke L-functions in the Grossencharacter-aspect*, 16 pp.

Abstract

The chief concern of the paper is to estimate the size of $L(1/2 + it, \chi\lambda^{am})$ as $m \rightarrow \infty$, where $\chi\lambda^a$ is a normalized Hecke character. We improve the convexity bound obtained by W.Duke.

13. A. Laurinčikas, W. Schwarz, J. Steuding *Value distribution of general Dirichlet series. III*, 21 pp.

Abstract

In the paper a limit theorem in the sense of the weak convergence of probability measures in the space of meromorphic functions for a function given by general Dirichlet series is proved. The explicit form of the limit measure is given.

14. A. Leibak (Estonia, Tallinn Technical University), *Some results on reduction of unary positive quadratic forms over totally real cyclic number fields*, 9 pp.

Abstract

In this paper we study the reduction theory of positive definite generalized quadratic forms over totally real cyclic number field. Based on the works by Koecher, Venkov and Shintani we present more detailed results on the reduction domain. As a result we present explicit description of the reduction domain for certain families of number fields of degree 2 and 3.

15. J.-L. Mauclair (Paris University VII), *To be announced*, 19 pp.

Abstract

We present some results on additive arithmetical functions in one and two variables with values in a group satisfying some regularity condition.

16. A. Mačiulis (Vilnius University), *Some formulas for the moments of additive functions*, 6 pp.
Abstract
 For a sequence of strongly additive arithmetic functions the integral limit theorem with a non-uniform estimate of the remainder is proved. This leads to the asymptotics for the moments. A formula with remainder for generalized moments is obtained.
17. E. Manstavičius (Vilnius University), *Functional limit theorems for sequences of mappings on the symmetric group*, 14 pp.
Abstract
 For a sequence of additive functions on the symmetric group endowed with the uniform probability measure, we define a sequence of random processes and consider weak convergence in the Skorokhod space as the order of the group increases. We establish the necessary and sufficient convergence conditions if the limit process is stochastically continuous and has independent increments. The main task is to prove that, in such case, the influence of the components of the additive functions on long cycles is asymptotically negligible.
18. K. Matsumoto (Japan, Nagoya University), *The analytic continuation and the asymptotic behaviour of multiple zeta-functions. II*, 8 pp.
Abstract
 The meromorphic continuation of generalized multiple zeta-functions, which has been shown under certain restrictions in the author's former paper, is proved in a fairly general situation.
19. K. Matsumoto, *Some problems on mean values and the universality of zeta and multiple zeta-functions*, 7 pp.
Abstract
 Here I propose and discuss several problems on analytic properties of some zeta-functions and multiple zeta-functions, which are related to my talk or to talks of other participants at the conference.
20. M. Nakasuji (Japan, Keio University), *Error term of the prime geodesic theorem*, 12 pp.
Abstract
 In the prime geodesics theorem for $(d + 1)$ -dimensional hyperbolic manifold, we obtain a few lower bounds of the error term.
21. F. Schweiger (Austria, Salzburg University), *Diophantine properties of multidimensional continued fractions*, 19 pp.
Abstract
 In this survey some recent results on Diophantine approximation by multidimensional continued fractions which mainly can be obtained by ergodic theoretic methods are presented.
22. J. Spilker (FRG, Freiburg University), *Almost periodicity of g -additive and g -multiplicative functions*, 9 pp.
Abstract
 I characterize those g -additive functions, that are almost periodic (Theorem 1 and 2). For g -multiplicative functions I give sufficient conditions for almost periodicity.
23. E. Stankus (Vilnius University), *On the Euler function $\varphi(n)$ with n in arithmetical progressions*, 7 pp.
Abstract
 The asymptotic formula for number of integers n , $n \equiv l \pmod{k}$, for which $\varphi(n) \leq x$, is obtained.

24. G. Stepanauskas (Vilnius University), *The mean values of multiplicative functions V: The large Δ* , 11 pp.

Abstract

The mean value theorem for the product of multiplicative functions the arguments of which run through arithmetic progressions and can increase fast enough is proved. Two simplified versions of this result are represented. One version includes the classical Euler function.

25. J. Steuding, *Dirichlet series associated to periodic arithmetic functions and the zeros of Dirichlet L -functions*, 16 pp.

Abstract

We investigate the value distribution of Dirichlet series $L(s, f) = \sum_{n=1}^{\infty} \frac{f(n)}{n^s}$ with q -periodic coefficients at the zeros of Dirichlet L -functions $L(s, \chi)$ associated to primitive characters $\chi \bmod Q$. This proves unconditionally some formulae due to Fujii which he obtained (with slightly better error terms) under assumption of the truth of Riemann's hypothesis, and leads to a necessary condition for the quotient $L(s, f)/L(s, \chi)$ to be an entire function.

26. J. Šiaulyš (Vilnius University), *On the separation of distributions of additive functions*, 5 pp.

Abstract

The weak convergence of distributions of a set of strongly additive functions is considered. In the case when the limit law has finite support, the paper presents the special form of the characteristic function of this limit distribution.

27. R. Šleževičienė (Vilnius University), *The joint universality for twists of Dirichlet series with multiplicative coefficients by characters*, 17 pp.

Abstract

In the paper the uniform approximation of a collection of analytic functions by a collection of translations of twists of Dirichlet series with multiplicative coefficients by characters is obtained.

28. P. Tammela, T. Gramushnjak (Estonia, Tallinn Technical University), *On C -types of positive definite quadratic forms*, 11 pp.

Abstract

In the present paper we investigate properties of C -types of positive definite quadratic forms. We give a new description of C -types; on the basis of this description we get an algorithm for finding C -types. The algorithm gives known results for $n \leq 5$ and we began computation of C -types for $n = 6$.

29. C. Tianxin (China, Zhejiang University), *Two 'Wolstenholme-type' theorems on q -binomial coefficients*, 4 pp.

Abstract

In this note we prove two 'Wolstenholme-type' Theorems on q -binomial coefficients, with the help of a result on partition of integers modulo prime.

30. V. Zacharovas (Vilnius University), *The convergence rate in CLT for random variables on permutations*, 12 pp.

Abstract

We investigate the convergence rate of distributions of random variables defined on a symmetric group endowed with the Ewens probability measure.