1082.60041
Esquível, Manuel L.
On the asymptotic behavior of the second moment of the Fourier transform of a random measure. (English)
Int. J. Math. Math. Sci. 2004, No.61-64, 3423-3434 (2004). [ISSN 0161-1712; ISSN 1687-0425]
http://dx.doi.org/10.1155/S0161171204210183

The author obtains an estimate for the asymptotic behavior of the second moment of the Fourier transform of the limit random measure in the theory of multiplicative chaos. After looking at the behavior at infinity of the Fourier transform of some remarkable functions and measures, the author proves a formula essentially due to Frostman, involving the Riesz kernels.

Ferenc Weisz (Budapest)
Classification :
*60G57 Random measures
42B10 Fourier type transforms, several variables

Cited in ...

0925.90125
Esquível, Manuel L.
Some risk processes associated to the dept function of a loan with variable interest rates. (English)
Z. Angew. Math. Mech. 76, Suppl. 3, 419-420 (1996). [ISSN 0044-2267]

Not reviewed

Classification :
*91B30 Risk theory etc.

Cited in ...

0898.60047
Esquível, Manuel Leote
Applications of Fourier methods to the analysis of some stochastic processes. (English, Portuguese)
Lisboa: Univ. Nova de Lisboa, Faculdade de Ciências e Tecnologia, xv, 101 p. (1996).

In the first chapter, a class of random periodic Schwartz distributions is introduced, some examples, elementary properties and a characterization result are studied and three applications are presented. A random Schwartz periodic distribution is, for us, just a function defined in a complete probability space and taking values in the space of Schwartz distributions over the line, that are left invariant by an integer translation, endowed with the natural algebraic and topological structures. The second chapter deals, primarily, with an extension of the methods of Kahane, as applied to the Brownian ...
sheet, in what concerns analogs of the rapid points. After presenting the Brownian sheet process, by way of Gaussian white noise, some results, on the local behavior of this process and for some other processes associated with the sheet, are derived using the Schauder series representation.

In the third chapter, we prove a formula essentially due to Frostman, we look at the behavior at infinity of the Fourier transform of some remarkable functions and measures and, finally, we study the asymptotic behavior of the second moment of the Fourier transform of a random measure that appears in the theory of multiplicative chaos. In the last chapter, a class of random tempered distributions on the line is introduced by considering random series, in the usual Hermite functions, having as coefficients random variables which satisfy certain growth conditions. This class is shown to be exactly the class of random Schwartz distributions having a mean. We present also a study on a possible converse of a result on Brownian distributions, that leads to a moment problem.

**Keywords**: random Schwartz periodic distribution; Brownian sheet; Fourier transform of a random measure; moment problem

**Classification**:

- 60G20 Generalized stochastic processes
- 60G17 Sample path properties
- 42B10 Fourier type transforms, several variables
- 46F25 Generalized functions on infinite-dimensional spaces

Cited in ...

0862.60030

**Esquivel, Manuel L.**

**On the local behavior of the Brownian sheet.** (English)

Fouque, Jean-Pierre (ed.) et al., Stochastic analysis: random fields and measure-valued processes. Papers of the binational France-Israel symposium on the Brownian sheet, September 1993, and the conference on measure-valued branching and superprocesses, May 1995, Ramat Gan, Israel. Ramat-Gan: Bar-Ilan University, Isr. Math. Conf. Proc. 10, 81-89 (1996).

In his seminal book “Some random series of functions” (1985; Zbl 0571.60002), J.-P. Kahane has shown, in a systematic way, how to take advantage of Paul Lévy’s construction of the Brownian process, using the Haar functions, in order to study the local behavior of this process. To reach this goal Kahane looks at the Haar’s interpolation of the Brownian process done by Lévy, as a series expansion in the Schauder system, having Gaussian random variables as coefficients, and exploits this series representation with sharp estimates of the distribution function of the maximum of a finite subfamily of a normal sequence. With this method Kahane gets easily the results corresponding to the existence of rapid points and slow points [which were first discovered by S. Orey and S. J. Taylor, Proc. Lond. Math. Soc., III. Ser. 28, 174-192 (1974; Zbl 0292.60128) and J.-P. Kahane, in: Conf. Harmonic Analysis in honor of A. Zygmund 1, 67-83 (1983; Zbl 0532.42001), respectively]. The present work deals with an extension of the methods of Kahane as applied to the Brownian sheet, in what concerns an analog of the rapid points.
Keywords: Brownian process; Haar functions; Brownian sheet

Classification:
- 60G17 Sample path properties
- 42C15 Series and expansions in general function systems

Cited in ...

0842.60052

Esquível, Manuel L.
Points of rapid oscillation for the Brownian sheet via Fourier-Schauder series representation. (English)
Kalten, Nigel (ed.) et al., Interaction between functional analysis, harmonic analysis, and probability. Proceedings of a conference held at the University of Missouri, Columbia, MO, USA, May 29-June 3, 1994. New York, NY: Marcel Dekker. Lect. Notes Pure Appl. Math. 175, 153-162 (1996). [ISBN 0-8247-9611-X/pbk]

The representation of the Brownian sheet as a sum of a series, which converges uniformly almost surely, of Schauder functions having as coefficients normal random variables, is a simple consequence of the definition of the Brownian sheet using Gaussian white noise. Some results on the local behavior of the Brownian sheet and for some other processes associated with the sheet, can be derived by using this representation. Namely, a uniform modulus of continuity, nondifferentiability results and at some points, faster oscillation than the one prescribed by the laws of iterated logarithm. In previous work [the author, “On the local behavior of the Brownian sheet”, in: Isr. Math. Conf. Proc., AMS 1994] rapid points and almost sure everywhere nondifferentiability for the location homogeneous part of the Fourier-Schauder series representation were presented. Here we show the existence of rapid points for the independent increments of the Brownian sheet, using the same method. This method, first used by J.-P. Kahane [“Some random series of functions” (1968; Zbl 0192.53801)] to deal with similar properties of the Brownian unidimensional time process, consists on exploiting the Fourier-Schauder representation with sharp estimates of the distribution function of the maximum of a finite subfamily of a normal sequence. Some results on the usual increments behavior are also presented.

Keywords: Brownian sheet; modulus of continuity; series representation; Fourier-Schauder representation; increments behavior

Classification:
- 60G60 Random fields
- 60B05 Probability measures on topological spaces
- 60J65 Brownian motion

Cited in ...

0846.41007

Esquível, Manuel L.
An introduction to limited polynomial expansions. (Portuguese)
Bol. Soc. Port. Mat. 30, 1-26 (1994). [ISSN 0872-3672]

This is a basically expository article. Its main objective is to show the advantages of
the well-known representation of the real functions $f : \mathbb{R} \to \mathbb{R}$ by means of their limited polynomial expansions (Taylor theorem). With illustrative character several elementary examples, comments and applications are given so that the didactic content of the paper is a feature to be remarked.

**N.Hayek (La Laguna)**

*Keywords*: Taylor theorem; real functions; limit polynomial expansions

*Classification*:

- *41A10* Approximation by polynomials
- *26-01* Textbooks (real functions)

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**Esquível, Manuel L.; de O.Martins, Maria Ana F.**

*On a basic theorem on the geometry of convex sets.* (Portuguese)

Bol. Soc. Port. Mat. 23, 22-32 (1992). [ISSN 0872-3672]

This is an expository article. First some simple properties of convex sets in $n$-space are given and then some theorems on the separation of convex sets from affine subspaces and other convex sets are proved.

**Bernd Wegner (Berlin)**

*Keywords*: convex sets; separation; affine subspaces

*Classification*:

- *52A20* Convex sets in $n$ dimensions

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**Esquível, Manuel L.**

*Sur une classe de distributions aléatoires périodiques.* (On a class of periodic random distributions). (French. Extended English abstract)

Ann. Sci. Math. Québec. 17, No.2, 169-186 (1993). [ISSN 0707-9109]

http://www.lacim.uqam.ca/annales/volumes/17-2/169.html

The theoretical foundations for the study and application of periodic random distributions have been established since at least the sixties. In the context of the fractal geometry of Benoit Mandelbrot, mathematical models of irregular surfaces that can be obtained by computer have led us to consider stochastic processes arising from Fourier series with random coefficients. In this article, we introduce a class of such periodic random distributions. Three examples of this case are: random mass on the unit circle, Brownian motion (classical and fractional) and classical Schwartz distributions that are randomized by translations. We begin with a result giving conditions which characterize the distributions of this class. These conditions are easy to verify and this is done for the three previous examples.

Two important questions in harmonic analysis are considered: uniqueness of the representation by Fourier series and differentiability. Also, we examine the statistical problem
of the existence of a generalized first moment for these random distributions. As an application, a classical result in Fourier analysis, useful for constructing particular solutions of ordinary differential equations with constant coefficients, is generalized to this class of periodic random distributions. This last result is applied to obtain the Fourier-Wiener-Schwartz series of a particular solution of a generalized Langevin equation. We conclude with a comment on the regularity of the solution.

Keywords: periodic random distributions; fractal geometry of Benoit Mandelbrot; Fourier series with random coefficients; random mass on the unit circle; Brownian motion; classical Schwarz distributions that are randomized by translations; existence of a generalized first moment; periodic random distributions; Fourier-Wiener-Schwartz series; Langevin equation; regularity

Classification:

* 46F10 Operations with distributions (generalized functions)
  60E99 Distribution theory in probability theory
  28A80 Fractals

Cited in ...

0743.46039

Esquível, Manuel L.
On some applications of harmonic analysis of a class of random distributions. (Portuguese. English summary)
Analysis, Proc. 15th Port.-Span. Meet. Math., Évora/Port. 1990, Vol. II, 285-290 (1991).

[For the entire collection see Zbl 0741.00014.]
Fractional Brownian movement is shown to be an example of a class of random Schwarz periodic distributions introduced and studied by the author in [Sur une application de l’analyse harmonique d’une class de distributions aleatoires, Relatório Técnico 890927, Mat. Esq. 1- F.C.T.-U.N.L.]. Using results there reported, a particular solution for a generalized Langevin equation is represented as a Fourier-Wiener-Schwartz series. A comment on the regularity of the solution is given.

Keywords: Fractional Brownian movement; random Schwarz periodic distributions; particular solution for a generalized Langevin equation; Fourier-Wiener-Schwartz series; regularity of the solution

Classification:

* 46F25 Generalized functions on infinite-dimensional spaces
  60G20 Generalized stochastic processes

Cited in ...

0676.35011

Esquível, Manuel L.
Sur la méthode des séries de Fourier dans les équations différentielles à coefficients constants. (On the method of Fourier series for differential equations with constant coefficients). (French)
The author extends the method of Fourier series to obtain solutions of the differential equation $P(D)u = f$ ($P(D) =$ differential polynomial with constant coefficients) to the case where $f$ does not satisfy the so called compatibility conditions $P(n) = 0 \Rightarrow \hat{f}(n) = 0$ ($\hat{f}(n) =$ coefficient of the Fourier-Schwartz transform).

R. Salvi

*Keywords: Fourier series; differential polynomial; constant coefficients; Fourier-Schwartz transform*

*Classification:*

*35E20 General theory of PDE with constant coefficients
35C10 Series solutions of PDE*

Cited in...

0606.28001

**Esquível, Manuel L.**

*Note sur les inclusions $L^1_{\mu} \subset L^1_{\lambda}$. (A note on the inclusions $L^1_{\mu} \subset L^1_{\lambda}$).* (French)

Trab. Invest. 1, 5 p. (1985).

In this note we explicitly enunciate and prove an easy and perhaps known condition on the Radon-Nikodým derivative of one measure relative to another, in order to get set inclusion of their respective $L^1$ spaces. Let $\lambda$ and $\mu$ be two $\sigma$-finite measures over a measure space and let $d\mu = hd\lambda + d\mu_1$ be the Lebesgue Radon-Nikodým decomposition of $\mu$ with respect to $\lambda$. A necessary and sufficient condition for $L^1_{\mu} \subseteq L^1_{\lambda}$ is that: $\exists K > 0 \lambda(\{h < K\}) = 0$.

No priority research about this subject has been done by the author.

*Keywords: $L^1$ inclusions; Radon-Nikodým derivative; Lebesgue Radon-Nikodým decomposition*

*Classification:*

*28A15 Differentiation of set functions
28A25 Integration with respect to measures and other set functions
46E30 Spaces of measurable functions
46E35 Sobolev spaces and generalizations*

Cited in...

0582.10024

**Gamas, Carlos D.; Esquível, Manuel L.**

*A property of periodic functions.* (Portuguese)

Bol. Soc. Port. Mat. 5, 56-59 (1982). [ISSN 0872-3672]

Die Autoren ”zeigen”, daß für irrationales $\alpha$ die Folge $n\alpha$ direkt modulo 1 ist (Satz 1), für rationale Zahlen aber nicht (Satz 2). Zum Beweis zitieren sie noch das entsprechende Resultat über die Gleichverteilung der Folge $(n\alpha)$!! Ein Aprilscherz? Die zitierten Resultate und Namen sind selten richtig geschrieben.
H. Rindler

Classification:

*11J71 Distribution modulo one

Cited in ...