zbMATH Open
THE FIRST RESOURCE FOR MATHEMATICS

Lyubarskij, Yurij I.; **Seip, Kristian**

Sampling and interpolation of entire functions and exponential systems in convex domains.

(English) Zbl 0819.30021
Ark. Mat. 32, No. 1, 157-193 (1994).

For an appropriate convex function h on the unit circle, the authors consider the Bargmann-Fock spaces of entire functions f under the norm

$$\int\int_C |f(z)|^2 \exp\bigl(-2h(\arg z)|z|^2\bigr)dm(z)$$

or $\sup |f(z)| \exp(''')$. For such spaces of entire functions the authors study associated sequences of complex numbers called sets of sampling and sets of interpolation and characterise such sets through NASC in terms of lower and upper angular densities. Cfr. *H. J. Landau*, Acta Math. 117, 37- 52 (1967; Zbl 0154.153); *K. Seip*, J. Reine Angew. Math. 429, 91- 106 (1992; Zbl 0745.46034); *K. Seip* and *R. Wallstén*, ibid. 107-113 (1992; Zbl 0745.46033)]. The sampling and interpolation results are applied to study expansions in series of exponentials in the Smirnov space $E^2(G)$, G being a bounded convex set in C, that consists of the closure of all polynomials in z with respect to the norm $\int_{\partial G} |f(z)|^2|dz|$. There is an appendix devoted to the construction of certain entire functions of regular growth, called "analogues of sine type functions".

Reviewer: E.J.Akutowicz (Montpellier)

MSC:

30E05 Moment problems and interpolation problems in the complex plane
30D10 Representations of entire functions of one complex variable by series and integrals
30D15 Special classes of entire functions of one complex variable and growth estimates

Cited in **13** Documents

Keywords:

sampling sets; interpolation sets; Bargmann-Fock spaces of entire functions; Smirnov space

Full Text: DOI

References:

[1] Beurling, A.,The Collected Works of Arne Beurling, Vol. 2 Harmonic analysis, pp. 341–365, Birkhäuser, Boston, 1989. · Zbl 0732.01042

[2] Brekke, S. andSeip, K., Density theorems for sampling and interpolation in the Bargmann-Fock space III, to appear inMath. Scand.

[3] Duffin, R. J. andSchaeffer A. C., A class of nonharmonic Fourier series,Trans. Amer. Math. Soc. 72 (1952), 341–366. · Zbl 0049.32401 · doi:10.1090/S0002-9947-1952-0047179-6

[4] Landau, H. J., Necessary density conditions for sampling and interpolation of certain entire functions,Acta Math. 117 (1967), 37–52. · Zbl 0154.15301 · doi:10.1007/BF02395039

[5] Leont'ev, A. F., On the representation of arbitrary functions by Dirichlet series,Dokl. Akad. Nauk SSSR 164 (1965), 40–42 (Russian). English transl.:Soviet Math. Dokl. 6 (1965), 1159–1161.

[6] Leont'ev A. F.,Exponential Series, Nauka, Moscow, 1976, (Russian).

[7] Levin, B. Ya.,Distribution of the Zeros of Entire Functions, GITTL, Moscow, 1956 (Russian). English transl.: Amer. Math. Soc., Providence, R.I., 1980.

[8] Levin, B. Ya., On bases of exponential functions inL 2(, {\(\pi\)}),Zap. Mat. Otdel. Fiz.-Mat. Fak. i Kharkov Mat. Obshsc. 27 (1961), 39–48 (Russian).

[9] Levin, B. Ya. andLyubarskiĭ, Yu. I., Interpolation by special classes of entire functions and related expansions in exponential series,Izv. Akad. Nauk SSSR Ser. Mat. 39 (1975), 657–702. (Russian). English transl.:Math. USSR-Izv. 9 (1975), 621–662. · Zbl 0324.30046

[10] Lutsenko, V. I.,Unconditional Bases from Exponentials in Smirnov Spaces, Thesis, Ufa, 1992 (Russian).

Edited by FIZ Karlsruhe, the European Mathematical Society and the Heidelberg Academy of Sciences and Humanities
© 2021 FIZ Karlsruhe GmbH

[11] Lutsenko, V. I. andYulmuhametov, R. S., Generalization of the Wiener-Paley theorem for functionals in Smirnov spaces,Proc. Steklov Inst. Math. 200 (1991), 245–254 (Russian).

[12] Lyubarskiĭ, Yu. I., The Paley-Wiener theorem for convex sets,Izv. Akad. Nauk Armyan. SSR. Ser. Mat. 23 (1988), 163–172 (Russian). English transl.:Soviet J. Contemporary Math. Anal. 23 (1988), 64–74.

[13] Lyubarskiĭ, Yu. I., Exponential series in Smirnov and interpolation by entire functions of special classes,Izv. Akad. Nauk SSSR Ser. Mat. 55 (1988), 559–580 (Russian). English transl.:Math. USSR-Izv. 32 (1989), 563–586.

[14] Lyubarskiĭ, Yu. I., Frames in the Bargmann space of entire functions,Adv. Soviet Math. 11 (1992), 167–180. · Zbl 0770.30025

[15] Lyubarskiĭ, Yu. I. andSodin, M. L., Analogues of sine type for convex domains,Preprint no. 17, Inst. Low Temperature Phys. Eng., Ukrainian Acad. Sci. (1986), Kharkov (Russian).

[16] Privalov, I. I.,Randeigenschaften analytischer Funktionen, GITTL, Moscow, 1950 (Russian). German transl.: VEB Deutscher Verlag Wiss., Berlin, 1956.

[17] Seip, K., Density theorems for sampling and interpolation in the Bargmann-Fock space I,J. Reine Angew. Math. 429 (1992), 91–106. · Zbl 0745.46034 · doi:10.1515/crll.1992.429.91

[18] Seip, K. andWallstén, R., Density theorems for sampling and interpolation in the Bargmann-Fock space II,J. Reine Angew. Math. 429 (1992), 107–113. · Zbl 0745.46033

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.

© 2021 FIZ Karlsruhe GmbH