method by N. Lebedev, J. Wimp, S. Yakubovich, Vu Kim Tuan, H.-J. Glaeske, and others; the hypergeometric approach based on the Mellin transforms of hypergeometric functions by O. Marichev; the convolution method by I. Dimovski, H.-J. Glaeske, S. Yakubovich, and V. Kakichev; and the operational method by V. Ditkin and A. Prudnikov.

As a conclusion, we invite all users of integral transformations and their applications to read this book. The references of this volume could be completed by mentioning the following recent monographs on integral transformations and related topics: *Handbook of Integral Transforms of Higher Transcendental Functions*, by O. Marichev (1983); *The Double Mellin–Barnes Type Integrals and Their Applications to Convolution Theory*, by Nguyen Thanh Hai and S. Yakubovich (1992); *The Hypergeometric Approach to Integral Transforms and Convolutions*, by S. Yakubovich and Yu. Luchko (1994); and *Index Transforms*, by S. Yakubovich (1996).

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Levan Zhizhiashvili, *Trigonometric Fourier Series and Their Conjugates*, Mathematics and Its Applications **372**, Kluwer, Dordrecht, 1996, xii + 300 pp.

Fourier series of one variable have been studied since Fourier (1769–1830) and the results have been relevant in various areas of mathematics, but also in the applied sciences, in particular physics, signal processing, and mechanics. Quite a few books deal with Fourier series of one variable, both from the theoretical and the practical point of view. In contrast with this, hardly any book is known that treats multiple trigonometric series, i.e., Fourier series of several variables. The present book partly fills this gap.

The book was first published in 1993 in Tbilisi, Georgia. This translation will surely make the book more easily available. There are two parts: part 1 deals with simple trigonometric series, and in part 2 multiple trigonometric series are covered. There are four chapters in part 1, in which the familiar results for the classical Fourier series of a function f of one variable are discussed. Right from the beginning, much emphasis is given on the conjugate function $\bar{f}$ and the Hilbert transform $\tilde{f}$.

Chapter 1 starts with the L^p-spaces and the H^p-spaces, moduli of smoothness, Privalov's theorem regarding Fourier series and their conjugates for Lipschitz functions and various extensions. Kolmogorov's theorem (that $\|\bar{f}\|_p \leqslant A(p)\,\|f\|_1$ for $0 < p < 1$), Titchmarsh's theorem

$$\int_{-\infty}^{\infty} \frac{|\tilde{f}(x)|^p}{1+x^2}\,dx < \infty, \qquad 0 < p < 1$$

for $f \in L(\mathbb{R})$, and Kober's improvement of Titchmarsh's theorem are treated in detail. A result by Hardy and Littlewood that $f \in \mathrm{Lip}(\alpha, p)$ for either $1 < p < \infty$ and $0 < \alpha \leqslant 1$, or $p = 1$ and $0 < \alpha < 1$ implies that also $\bar{f} \in \mathrm{Lip}(\alpha, p)$, gets detailed attention, and some improvements are given.

Chapter 2 is about pointwise convergence and summability of trigonometric series. Various classical results on convergence and divergence of trigonometric series are presented. The Cesàro means of the partial sums of the Fourier series and the partial sums of the conjugate series are considered here in detail. Chapter 3 deals with convergence and summability in the spaces $L^p([-\pi, \pi])$, for $0 < p \leqslant \infty$. The cases when $0 < p \leqslant 1$ and $1 \leqslant p \leqslant \infty$ are treated separately, and Fourier series (and their conjugate series) for odd and even functions are singled out. Chapter 4 finally gives some approximating properties of the Cesàro means.

Part 2 contains five chapters, the first four of which are in parallel with the four chapters of part 1 (even with the same titles), but in the multivariate setting. The fifth chapter in part 2 deals with summability for the two-variable case using a method of Marcinkiewicz type. Several aspects of the theory of multiple trigonometric series, the existence and properties of the conjugates and Hilbert transforms, convergence (pointwise and in L^p), and summability are covered, very much in parallel with the development of the theory for one variable in part 1. However, special emphasis is placed on the new effects which arise when dealing with multiple series and which are not present in the one-variable case. Many results of the author are presented here, often with new proofs that were not published before.

All chapters follow the same pattern: first a brief survey of known results is given, then some deeper results are treated in more detail, and at the end of each chapter some unsolved problems are formulated. The latter makes this book a very useful source of research problems, recommended for new researchers in this area.

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Proceedings

Total Positivity and Its Applications, M. Gasca and C. A. Micchelli, Eds., Mathematics and Its Applications **359**, Kluwer, Dordrecht, 1996, x + 518 pp.

This volume contains the invited lectures and contributed talks presented at the meeting on *Total Positivity and Its Applications*, held at the University of Zaragoza in Jaca, Spain, during the week of September 26–30, 1994. The book is dedicated to S. Karlin, who had planned to attend the meeting but had to cancel his participation. However, he managed to prepare a few contributions for these proceedings. The book has 10 sections dealing with spline functions, matrix theory, geometric modeling, probability and mathematical biology, approximation theory, complex analysis, statistics, real analysis, combinatorics, and integral equations. In all there are 23 contributions.

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Approximation Theory VIII, C. K. Chui and L. L. Schumaker, Eds., Series in Approximations and Decompositions **6**, World Scientific, Singapore, 1995, *Vol. I: Approximation and Interpolation*, xxxi + 604 pp., *Vol. II: Wavelets and Multilevel Approximation*, xxix + 452 pp.

This is the collection of the refereed papers presented at the 8th Texas *International Conference on Approximation Theory*, College Station, Texas, January 8–12, 1995. The first volume, *Approximation and Interpolation*, includes contributions of such important areas as qualitative approximations, interpolation theory, rational approximation, radial-basis functions, and splines. The second volume, *Wavelets and Multilevel Approximation*, focuses on topics related to wavelet analysis, including multiresolution analysis, multilevel approximation, subdivision schemes in computer aided geometric design, and applications.

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