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Sinopsis

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Fourier analysis encompasses a variety of perspectives and techniques. This volume presents the real variable methods of Fourier analysis introduced by Calderón and Zygmund. The text was born from a graduate course taught at the Universidad Autónoma de Madrid and incorporates lecture notes from a course taught by José Luis Rubio de Francia at the same university.

Motivated by the study of Fourier series and integrals, classical topics are introduced, such as the Hardy-Littlewood maximal function and the Hilbert transform. The remaining portions of the text are devoted to the study of singular integral operators and multipliers. Both classical aspects of the theory and more recent developments, such as weighted inequalities, H 1 , BMO spaces, and the T1 theorem, are discussed.

Chapter 1 presents a review of Fourier series and integrals; Chapters 2 and 3 introduce two operators that are basic to the field: the Hardy-Littlewood maximal function and the Hilbert transform. Chapters 4 and 5 discuss singular integrals, including modern generalizations. Chapter 6 studies the relationship between H 1 , BMO , and singular integrals; Chapter 7 presents the elementary theory of weighted norm inequalities. Chapter 8 discusses Littlewood-Paley theory, which had developments that resulted in a number of applications. The final chapter concludes with an important result, the T1 theorem, which has been of crucial importance in the field.

This volume has been updated and translated from the Spanish edition that was published in 1995. Minor changes have been made to the core of the book; however, the sections, "Notes and Further Results" have been considerably expanded and incorporate new topics, results, and references. It is geared toward graduate students seeking a concise introduction to the main aspects of the classical theory of singular operators and multipliers. Prerequisites include basic knowledge in Lebesgue integrals and functional analysis.

Readership

Graduate students and research mathematicians interested in Fourier analysis.

Reviews

"This is a great introductory book to Fourier analysis on Euclidean spaces and can serve as a textbook in an introductory graduate course on the subject ... The chapters on the Hardy-Littlewood maximal function and the Hilbert transform are extremely well written ... this is a great book and is highly recommended as an introductory textbook to Fourier analysis. The students will have a lot to benefit from in the simple and quick presentation of the book."