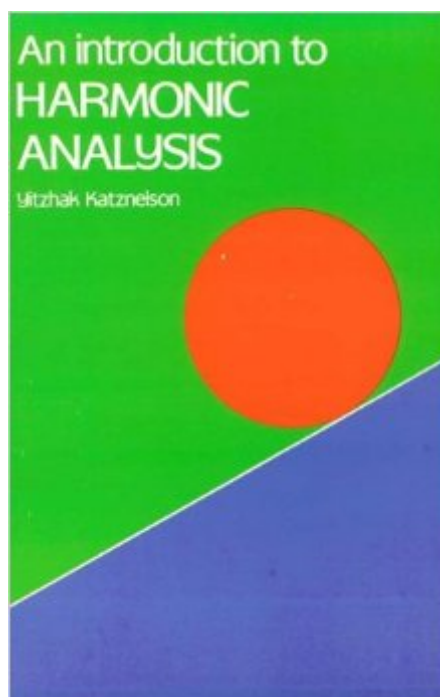


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# An Introduction To Harmonic Analysis



## Synopsis

This concrete approach to harmonic analysis begins with the circle group  $T$  and deals with classical Fourier series in the first five chapters, turning to the real line in chapter six, locally compact abelian groups in chapter seven, and commutative Banach algebras in final chapter.

## Book Information

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## Customer Reviews

When the first edition of Katznelson's book appeared back in 1968 (when I was a student), it soon became the talked about, and universally used, reference volume for the standard tools of harmonic analysis: Fourier series, Fourier transforms, Fourier analysis/synthesis, the math of time-frequency filtering, causality ideas,  $H^p$ -spaces, and the various incarnations of Norbert Wiener's ideas on the Fourier transform in the complex domain, Paley-Wiener, spectral theory, and more. It is easy to pick up the essentials in this lovely book. Now, many years later, I occasionally ask beginning students what their favorite reference is on things like that, and more often than not, it is Katznelson. Thanks to Dover, it is on the shelf of most university bookstores, and priced under US\$ 10.

Katznelson's book considers harmonic analysis primarily on the circle group. He does this from a thoroughly modern point of view. An understanding of the basic ideas of Banach spaces is required. This book should be on the shelf of any aspiring Harmonic Analyst, especially one with an abstract viewpoint.

This is a great book for looking at classical harmonic analysis: the study of Fourier Series on the

"typical" groups, includes a quick look at the general situation and ends with an introduction to commutative Banach Algebras. Both topics are continued in [Loomis].

Katznelson includes good topics, but for each topic in this book there is a better place to learn it from. For my taste, Grafakos, *Classical Fourier Analysis* (Graduate Texts in Mathematics), is strictly better than Katznelson. It includes almost all the same content, but does things in more detail and the presentation is more clear. In fact Grafakos is better both for the learner and as a reference. Another harmonic analysis book that is easy to understand and has great chapters on probability and wavelets is Pinsky, *Introduction to Fourier Analysis and Wavelets* (Graduate Studies in Mathematics). For the Gelfand theory of Banach algebras, my favorite book is Rudin's "Functional Analysis". A book that is rather similar to Katznelson is Muscalu and Schlag, *Classical and Multilinear Harmonic Analysis* (Cambridge Studies in Advanced Mathematics) (Volume 1), and Muscalu and Schlag are interested in partial differential equations which Katznelson has nothing to say about. If you are learning harmonic analysis on your own, I recommend looking through the above books rather than using Katznelson. But if you are taking a course that follows Katznelson, let me say that it is not a bad book and if you have someone to ask questions you will indeed be able to learn from it.

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