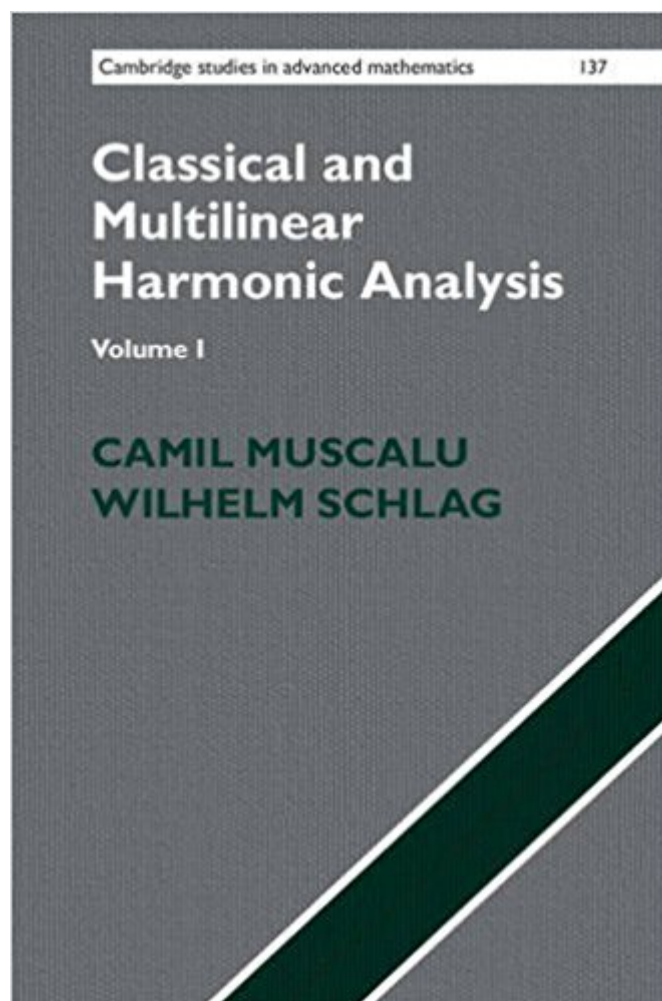


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Classical And Multilinear Harmonic Analysis (Cambridge Studies In Advanced Mathematics) (Volume 1)



Synopsis

This two-volume text in harmonic analysis introduces a wealth of analytical results and techniques. It is largely self-contained and will be useful to graduate students and researchers in both pure and applied analysis. Numerous exercises and problems make the text suitable for self-study and the classroom alike. This first volume starts with classical one-dimensional topics: Fourier series; harmonic functions; Hilbert transform. Then the higher-dimensional Calderón-Zygmund and Littlewood-Paley theories are developed. Probabilistic methods and their applications are discussed, as are applications of harmonic analysis to partial differential equations. The volume concludes with an introduction to the Weyl calculus. The second volume goes beyond the classical to the highly contemporary and focuses on multilinear aspects of harmonic analysis: the bilinear Hilbert transform; Coifman-Meyer theory; Carleson's resolution of the Lusin conjecture; Calderón's commutators and the Cauchy integral on Lipschitz curves. The material in this volume has not previously appeared together in book form.

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The subject material in Volume 1 is without a doubt a prerequisite to reading any modern research in dispersive PDE and Harmonic Analysis. This volume contains beautiful treatments of Calderon-Zygmund theory, Littlewood-Paley theory, and Fourier Restriction, all of which come alive with clearly motivated applications to PDE. The chapter on the Uncertainty Principle helps one build

a deep and tangible understanding of the idea that it is not possible to be highly localized in space and in frequency. The exercises throughout the chapter help one build intuition and the problems at the ends of each chapter truly test one's understanding and give the reader a real flavor for the types of ideas that go into original research. From my experience, some of them are extremely challenging. In my opinion this book is simply peerless and should be a part of every graduate student's introduction to the field. They give every student the incredible opportunity to learn from Professors Muscalu and Schlag who are simply two of the best in the business.

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