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Sinopsis

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This volume contains the proceedings of the AMS Special Session on Wavelet and Frame Theoretic Methods in Harmonic Analysis and Partial Differential Equations, held September 22-23, 2012, at the Rochester Institute of Technology, Rochester, NY.

The book features new directions, results and ideas in commutative and noncommutative abstract harmonic analysis, operator theory and applications. The commutative part includes shift invariant spaces, abelian group action on Euclidean space and frame theory; the noncommutative part includes representation theory, continuous and discrete wavelets related to four dimensional Euclidean space, frames on symmetric spaces, C?-algebras, projective multiresolutions, and free probability algebras.

The scope of the book goes beyond traditional harmonic analysis, dealing with Fourier tools, transforms, Fourier bases, and associated function spaces. A number of papers take the step toward wavelet analysis, and even more general tools for analysis/synthesis problems, including papers on frames (over-complete bases) and their practical applications to engineering, cosmology and astrophysics.

Other applications in this book include explicit families of wavelets and frames, as they are used in signal processing, multiplexing, and the study of Cosmic Microwave Background (CMB) radiation.

For the purpose of organization, we have divided the book into three parts: noncommutative, commutative, and applications. The first group of papers are devoted to problems in noncommutative harmonic analysis, the second to topics in commutative harmonic analysis, and the third to such applications as wavelet and frame theory and to some real-world applications.

Readership

Graduate students and research mathematicians interested in harmonic analysis, noncommutative harmonic analysis, representation theory, analysis and its applications, and signal processing.

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