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Sommario/riassunto	This volume contains a systematic discussion of wavelet-type inversion formulae based on group representations, and their close connection to the Plancherel formula for locally compact groups. The connection is demonstrated by the discussion of a toy example, and then employed for two purposes: Mathematically, it serves as a powerful tool, yielding existence results and criteria for inversion formulae which generalize many of the known results. Moreover, the connection provides the starting point for a – reasonably self-contained – exposition of Plancherel theory. Therefore, the book can also be read as a problem-driven introduction to the Plancherel formula.