Título: Higher Order Fourier Analysis

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Traditional Fourier analysis, which has been remarkably effective in many contexts, uses linear phase functions to study functions. Some questions, such as problems involving arithmetic progressions, naturally lead to the use of quadratic or higher order phases. Higher order Fourier analysis is a subject that has become very active only recently. Gowers, in groundbreaking work, developed many of the basic concepts of this theory in order to give a new, quantitative proof of Szemerédi's theorem on arithmetic progressions. However, there are also precursors to this theory in Weyl's classical theory of equidistribution, as well as in Furstenberg's structural theory of dynamical systems.

This book, which is the first monograph in this area, aims to cover all of these topics in a unified manner, as well as to survey some of the most recent developments, such as the application of the theory to count linear patterns in primes. The book serves as an introduction to the field, giving the beginning graduate student in the subject a high-level overview of the field. The text focuses on the simplest illustrative examples of key results, serving as a companion to the existing literature on the subject. There are numerous exercises with which to test one's knowledge.