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Fourier analysis on local fields, by M. H. Taibleson, Mathematical Notes, Princeton University Press, Princeton, New Jersey, 1975, xii+294 pp., \$7.00.

This book contains the lecture notes of a course given by the author at Washington University, Saint Louis during the Fall and Spring semester 1972–1973. Many results have appeared earlier in a series of papers, some of them written in collaboration with P. Sally, R. A. Hunt and K. Phillips. We find in this book well-known concepts from classical analysis: the Fourier transform, the Hankel transform, Gamma, Beta and Bessel functions, the Poisson summation formula, Fourier series, Césaro sums, fractional integration and many others. But from the title of the book it is clear that these subjects are treated here for a situation different from the classical one. In the classical case these subjects are discussed in the context of analysis on a euclidean space. In this book, however, the theory is developed for local fields, with emphasis, almost exclusively, on totally disconnected fields and on the analogy between this case and the euclidean case.

It is striking to observe the enormous evolution of the subject in two centuries, especially the revolution in the last fifty years. The great lines of this development are most interesting and they are an excellent illustration of the influence of algebra and topology on the form and contents of contemporary analysis.

Fourier series were studied by D. Bernoulli, D'Alembert, Lagrange and Euler from about 1740 onwards. They were led by problems in mathematical physics to study the possibility of representing a more or less arbitrary function f with period 2π as the sum of a trigonometric series of the form

$$\frac{a_0}{2}+\sum_{n=1}^{\infty}(a_n \cos nx + b_n \sin nx).$$

Dirichlet (1829) and later Riemann (1854) started the study of these series in a more rigorous way. This was continued by Cantor—who showed that a