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# Fourier sums in weighted spaces of functions. A survey.<sup>†</sup>

G. Mastroianni and M. G. Russo

## Abstract

This survey is devoted to the study of the behaviour of the Fourier sums in weighted spaces of functions. The cases of functions supported on bounded or unbounded intervals of the real line are investigated. In particular the proof of the Riesz theorem is extended to the case of Fourier sums in systems of suitable orthonormal polynomials.

**Keywords:** Fourier sums, orthogonal polynomials.

**MSC:** Primary 42A20; Secondary 42C05, 42C10.

## §1. Introduction

Trigonometric series (of one variable) are a fruitful topic of the classical Analysis, they appear in several scientific contexts and they were the starting point, as well as tools, in the development of some important chapters of the Mathematics and the other Sciences.

Here we cannot describe in the details the development of this subject involving a very large number of mathematicians, as the wide list of their contributions shows (see the books [50, 4] and the references therein).

The expansion of not periodic functions in systems of orthogonal polynomials shows deeper difficulties and it is still a research topic.

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D. Leviatan

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