Public Abstract

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Title:ALMOST EVERYWHERE CONVERGENCE FOR MODIFIED BOCHNER-RIESZ MEANS AT THE CRITICAL INDEX FOR p GREATER THAN OR EQUAL TO 2.

The Fourier transform is a mathematical operation that can be used with its inverse to rewrite a function as a sum of waves. It has been a useful mathematical tool for many applied sciences.

Sometimes Fourier inversion is not possible in the classic sense and needs to be generalized. This is often done in a standard way, after choosing a summability method.

A famous and much studied one is the method of the Bochner-Riesz means.

We use techniques and results of harmonic analysis (Plancharel-type inequalities, partitions of the euclidean space, an analytic continuation argument, maximal operators, duality, potentials etc.) to investigate the method of the Bochner-Riesz means modified by A. Seeger.

We prove that the Fourier inversion with respect to the modified Bochner-Riesz means holds pointwise almost everywhere for a certain class of functions.

First of all, this result refines a Theorem of A. Carbery, J. Rubio de Francia and L. Vega.

Secondly, it highlights the connection between the choice of the method one can use to invert the Fourier transform and the class of functions on which the method will work.

Finally, it also shows how to generalize certain techniques to a scenario where we lack certain algebraic properties.