

Second Hyperfunctions, Regular Sequences, and Fourier Inverse Transforms

Otto Liess Yasunori Okada Nobuyuki Tose

To the memory of our friend Pascal

Abstract Second hyperfunctions are formal boundary values of microfunctions with holomorphic parameters defined on wedges in much the same way in which classical hyperfunctions are boundary values of holomorphic functions defined on wedges. Since microfunctions with holomorphic parameters are themselves already defined in a formal way, second hyperfunctions have a rather non-intuitive definition and few explicit examples of second hyperfunctions which are not classical are known. In this paper we shall show that one can arrive at a better understanding by introducing the notion of regular sequences of holomorphic functions. We shall then show that representation of second hyperfunctions in terms of regular sequences is quite efficient in the context of regularization of the Fourier-inverse transform of functions which appear in second microlocalization.

Keywords: second hyperfunctions, microfunctions with holomorphic parameters, Fourier-transform

1 Introduction

Second hyperfunctions, are the natural frame for second microlocalization. They have been introduced in 1970 by T.Kawai and M.Kashiwara, as a very natural extension of standard hyperfunctions and have many interesting properties. In particular they form a rather large space of generalized functions in which calculations are often easier to perform than in classical hyperfunctions or in distributions. Related to this is the fact