

Extension to a sector of asymptotic expansions in a direction with strongly regular constraints

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Abstract

A. Fruchard and C. Zhang [1] have established the relationship between the notion of asymptotic expansion in one direction, and the notion of asymptotic expansion in a sector. They have shown that if we consider a complex function analytic and bounded on some sector such that it has asymptotic expansion in one direction of the sector, then the same asymptotics, in the Poincaré sense or in the Gevrey sense, remains valid in the whole sector. In this work, we generalize these results for asymptotic estimates given in terms of a well-behaved strongly regular sequence $\mathbb{M} = (M_p)_{p \in \mathbb{N}_0}$. However, in this situation we are not able to give precise information about the variation of the exponential type of \mathbb{M} -flat functions in a direction.

We use the summability methods for ultraholomorphic classes in sectors, which have been put forward by A. Lastra, S. Malek and J. Sanz [3]. Their validity depends on the possibility of associating with \mathbb{M} a nonzero proximate order. This has been characterized by J. Sanz, G. Schindl and the author in [2].

Joint work with Javier Sanz (Universidad de Valladolid, Spain) and Gerhard Schindl (University of Vienna, Austria).

References

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- [3] A. Lastra, S. Malek, J. Sanz, Summability in general Carleman ultraholomorphic classes, *J. Math. Anal. Appl.* 430 (2015), 1175–1206.