Multi-frequency Calderón-Zygmund analysis applied to Bochner-Riesz multipliers

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Abstract

We plan to present a "multi-frequency Calderón-Zygmund analysis", introduced by Nazarov, Oberlin and Thiele and some applications. These results extend the classical theory. Indeed, it allows us to study a new kind of Calderón-Zygmund operators, mainly the sum of modulated Calderón-Zygmund operators.

Aiming to extend the classical results to these new operators, we first prove boundedness and then weighted boundedness. To do so, we make use of the abstract good-λ inequalities of Auscher and Martell, associated to a maximal sharp function (taking care of the "multi-frequency" framework).

This work is motivated by applications to the well-known Bochner-Riesz multipliers. Indeed, we will explain how such arguments allow us to get new weighted boundedness for such multipliers, involving Muckenhoupt's weights. Moreover, this approach is very general and can be applied to generalised Bochner-Riesz multipliers (where the disc or the ball is replaced by another geometrical set).