

## Maximal functions associated to Mihlin-Hörmander multipliers

We report on joint work with Michael Christ, Loukas Grafakos and Petr Honzík ([1], [2]). Consider Fourier multipliers satisfying a condition of Mihlin-Hörmander type,

$$\|\phi m(2^k \cdot)\|_{L^p} \lesssim \omega(k), \quad k \in \mathbb{Z},$$

with suitable assumptions on  $\omega(k)$ .

We give some answers to the following questions:

(i) Under what conditions on  $m$  does the maximal function

$$Mf = \sup_{t>0} |\mathcal{F}^{-1}[m(t \cdot) \widehat{f}]|$$

define a bounded operator on  $L^p(\mathbb{R}^d)$ ?

(ii) Given  $N$  Mihlin-Hörmander multipliers  $m_i$ , what is the best bound  $C_N$  in the inequality

$$\left\| \sup_{i=1, \dots, N} |\mathcal{F}^{-1}[m_i(t \cdot) \widehat{f}]| \right\|_p \leq C_N \|f\|_p ?$$

### REFERENCES

- [1] M. Christ, L. Grafakos, P. Honzík and A. Seeger, *Maximal functions associated with multipliers of Mihlin-Hörmander type*, Math. Z., published online, August 2004.
- [2] L. Grafakos, P. Honzík and A. Seeger, *On maximal functions for Mihlin-Hörmander multipliers* Preprint Nov. 2004.