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Wavelet characterisation of Besov-Morrey and Triebel-Lizorkin-Morrey spaces

In a series of papers Y. Sawano [1, 2, 3] has investigated decompositions in terms of atoms, molecules and wavelets in Besov-Morrey and Triebel-Lizorkin-Morrey spaces. The aim of the talk is to present an improvement of his result. We give a sufficient condition for the smoothness of the underlying Daubechies-Wavelets. There is an isomorphism of function spaces and related sequence spaces. Moreover, the wavelet-representation converges unconditional in S' but not in the Besov-Morrey and Triebel-Lizorkin-Morrey spaces. This is sharp in a certain sense and means that we do not get bases in the spaces under consideration. The proofs follow ideas of H. Triebel [5, 4]. A systematic treatment using atomic decompositions and local means can be found in [6].

References

- (1) Y. Sawano, H. Tanaka. *Decompositions of Besov-Morrey spaces and Triebel-Lizorkin-Morrey spaces*, Math. Z. 257 (2007), no. 4, 871–905.
- (2) Y. Sawano. *Wavelet characterization of Besov-Morrey and Triebel-Lizorkin-Morrey spaces* Funct. Approx. Comment. Math. 38 (2008), part 1, 93–107.
- (3) Y. Sawano. *A note on Besov-Morrey spaces and Triebel-Lizorkin-Morrey spaces* Acta Math. Sin. (Engl. Ser.) 25 (2009), no. 8, 1223–1242.
- (4) H. Triebel. *Wavelet para-bases and sampling numbers in function spaces on domains*, J. Complexity **23** (2007), 468–497.
- (5) H. Triebel. *Wavelets in function spaces on Lipschitz domains*, Math. Nachr. **280** (2007), 1205–1218.
- (6) H. Triebel. *Function Spaces and Wavelets on domains*, EMS Tracts in Mathematics (ETB). European Mathematical Society (EMS), Zürich, 2008.