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Embeddings of generalized Morrey smoothness spaces

In this talk, we study embeddings between generalized Triebel–Lizorkin–Morrey spaces $\mathcal{E}_{\varphi,p,q}^s(\mathbb{R}^d)$ and within the scales of further generalized Morrey smoothness spaces like $\mathcal{N}_{\varphi,p,q}^s(\mathbb{R}^d)$, $F_{p,q}^{s,\varphi}(\mathbb{R}^d)$ and $B_{p,q}^{s,\varphi}(\mathbb{R}^d)$. The latter have been investigated in [1], while the embeddings of the scale $\mathcal{N}_{\varphi,p,q}^s(\mathbb{R}^d)$ were mainly obtained in [2]. Our approach requires a wavelet characterisation of those spaces which we establish for the system of Daubechies' wavelets. Then we prove necessary and sufficient conditions for the embedding $\mathcal{E}_{\varphi_1,p_1,q_1}^{s_1}(\mathbb{R}^d) \hookrightarrow \mathcal{E}_{\varphi_2,p_2,q_2}^{s_2}(\mathbb{R}^d)$. We also provide an almost final answer to the embeddings of Franke–Jawerth type.

This is joint work with Dorothee D. Haroske (Jena), Susana D. Moura (Coimbra) and Leszek Skrzypczak (Poznań).

References.

- [1] D.D. Haroske and Z. Liu, Generalized Besov-type and Triebel–Lizorkin-type spaces, *Studia Math.* 273(2) (2023), 161–199.
- [2] D.D. Haroske, S.D. Moura and L. Skrzypczak, Wavelet decomposition and embeddings of generalised Besov–Morrey spaces, *Nonlinear Anal.*, 214(1) (2022), no. 112590.