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Embeddings of Besov-type and Triebel-Lizorkin-type spaces on domains

Besov-type spaces $B^{s,\tau}_{p,q}(\mathbb{R}^d)$ and Triebel-Lizorkin-type spaces $F^{s,\tau}_{p,q}(\mathbb{R}^d)$, $0 < p < \infty$ (or $p = \infty$ in the B-case), $0 < q \le \infty$, $\tau \ge 0$, $s \in \mathbb{R}$, are part of a class of function spaces built upon Morrey spaces $\mathcal{M}_{u,p}(\mathbb{R}^d)$, $0 < p \le u < \infty$. For this reason, they are usually called in the literature as *smoothness spaces of Morrey type* or, shortly, *smoothness Morrey spaces*. The increasing study in the last decades is motivated primarily by possible applications. We mention partial differential equations, such as (fractional) Navier-Stokes equations.
In this talk, we present embeddings of Besov-type and Triebel-Lizorkin-type spaces on a bounded domain $\Omega \subset \mathbb{R}^d$,

$$\mathrm{id}_\tau\colon B^{s_1,\tau_1}_{p_1,q_1}(\Omega) \hookrightarrow B^{s_2,\tau_2}_{p_2,q_2}(\Omega) \quad \text{and} \quad \mathrm{id}_\tau\colon F^{s_1,\tau_1}_{p_1,q_1}(\Omega) \hookrightarrow F^{s_2,\tau_2}_{p_2,q_2}(\Omega).$$

Aiming at the continuity and compactness of id_τ, we give necessary and sufficient conditions for such properties to be achieved.

This talk is based on a joint work with D. D. Haroske and L. Skrzypczak.

References.

[1] H. F. Gonçalves, D. D. Haroske and L. Skrzypczak, Compact embeddings on Besov-type and Triebel-Lizorkin-type spaces on bounded domains. Rev. Mat. Complut. 34 (2021), 761–795.

[2] H. F. Gonçalves, D. D. Haroske and L. Skrzypczak, Limiting embeddings of Besov-type and Triebel-Lizorkin-type spaces on domains and an extension operator. Submitted; arXiv:2109.12015v2 (math.FA).