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## Oscillations and differences in Besov-Morrey and Besov-type spaces

In this talk, we discuss new characterizations of Besov-Morrey spaces  $\mathcal{N}_{u,p,q}^s$  and Besov-type spaces  $B_{p,q}^{s,\tau}$  of positive smoothness  $s$  in terms of local oscillations (i.e., local polynomial bestapproximations) as well as integral means of higher order differences [1]. Both families of function spaces generalize the well-established scale of Besov spaces by essentially replacing the  $L_p$ -quasi-norm in the Fourier analytic definition of  $B_{p,q}^s$  by suitable Morrey quasi-norms. In contrast to similar modifications of the Triebel-Lizorkin scale studied previously in [2], in the Besov setting [1] both approaches of generalization lead to different results for almost all parameter constellations. However, we will show that the technique we developed in [2] likewise allows to reprove and extend known assertions (due to Triebel 1992 and Yuan/Sickel/Yang 2010) for both scales of Besov-like spaces on  $\mathbb{R}^d$  and to derive corresponding results for their restrictions to bounded Lipschitz domains  $\Omega$ . In addition, if time permits, we shall indicate possible applications to the regularity theory of quasi-linear elliptic PDEs.

The results to be presented are based on recent joint work [1, 2] with Marc Hovemann (Marburg/Jena).

### References.

- [1] M. Hovemann and M. Weimar. *Oscillations and differences in Besov-Morrey and Besov-type spaces*. Preprint (arXiv:2405.20662), 2024.
- [2] M. Hovemann and M. Weimar. *Oscillations and differences in Triebel-Lizorkin-Morrey spaces*. *Rev. Mat. Complut.*, 2024.