

OSCILLATIONS AND DIFFERENCES IN TRIEBEL-LIZORKIN-MORREY SPACES

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In this talk, we discuss new characterizations of Triebel-Lizorkin-Morrey spaces $\mathcal{E}_{u,p,q}^s$ of positive smoothness s in terms of local oscillations (i.e., local polynomial bestapproximations) as well as integral means of higher order differences. This family of function spaces generalizes the well-established scale of Triebel-Lizorkin spaces $F_{p,q}^s$ which particularly contains the usual L_p -Sobolev spaces $H_p^s = F_{p,2}^s$ as special cases. Moreover, there are strong relations to BMO and Campanato spaces. We extend assertions due to Triebel 1992 and Yuan/Sickel/Yang 2010 for spaces on \mathbb{R}^d and additionally consider their restrictions to bounded Lipschitz domains Ω . Furthermore, we indicate possible applications to the regularity theory of quasi-linear elliptic PDEs.

The results to be presented are based on a recent preprint [1] in joint work with Marc Hovemann (Marburg).

[1] M. Hovemann and M. Weimar. Oscillations and differences in Triebel-Lizorkin-Morrey spaces. Preprint in preparation, 2023.

Joint work with Marc Hovemann (Marburg).