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Leibniz
Universität
Hannover

Oberseminar

Analysis und Theoretische Physik

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Friedrich-Schiller-Universität Jena

Embeddings of Besov–Morrey function spaces

The classical Morrey spaces $\mathcal{M}_{p,u}$, $0 < u \leq p < \infty$, were introduced by Ch.B. Morrey (1938) and are part of the wider class of Morrey–Campanato spaces. They contain all locally u -integrable functions f such that

$$\|f\|_{\mathcal{M}_{p,u}(\mathbb{R}^d)} = \sup_{x \in \mathbb{R}^d, R > 0} R^{\frac{d}{p} - \frac{d}{u}} \left(\int_{B(x,R)} |f(y)|^u dy \right)^{1/u}$$

is finite, where $B(x, R)$ are the usual balls centered at $x \in \mathbb{R}^d$ with radius $R > 0$. In view of $L_p(\mathbb{R}^d) = \mathcal{M}_{p,p}(\mathbb{R}^d) \hookrightarrow \mathcal{M}_{p,u}(\mathbb{R}^d)$ for any $u \leq p$ they are considered as an extension of the scale of L_p spaces. Built upon these basic spaces Besov–Morrey (and Triebel–Lizorkin–Morrey) spaces attracted some attention in the last years, in particular, in connection with Navier–Stokes equations. Though a lot has been done recently, almost nothing is known about properties of embeddings of these spaces and corresponding applications to spectral theory.

We study embeddings of spaces of Besov–Morrey type,

$$\mathcal{N}_{p_1, u_1, q_1}^{s_1}(\Omega) \hookrightarrow \mathcal{N}_{p_2, u_2, q_2}^{s_2}(\Omega),$$

and obtain necessary and sufficient conditions for the continuity or compactness of such an embedding, where Ω denotes either \mathbb{R}^d or a sufficiently smooth bounded domain in \mathbb{R}^d . We can also characterise the special weighted situation $B_{p_1, q_1}^{s_1}(\mathbb{R}^d, w) \hookrightarrow \mathcal{N}_{p_2, u_2, q_2}^{s_2}(\mathbb{R}^d)$ for a Muckenhoupt \mathcal{A}_∞ weight w , with $w_\alpha(x) = |x|^\alpha$, $\alpha > -d$, as a typical example. Finally we discuss some embeddings of Besov–Morrey type spaces into classical spaces like $L_p(\Omega)$ or $C(\Omega)$, and give some parallel results for spaces of Triebel–Lizorkin–Morrey type $\mathcal{E}_{p_1, u_1, q_1}^{s_1}(\Omega)$.

This is joint work with Leszek Skrzypczak (Poznań).

Dienstag, 14.5.2013, 15:00 Uhr, Raum g005
Hauptgebäude der Leibniz Universität

Dazu laden herzlich ein: Prof. Dr. Joachim Escher, Prof. Dr. Olaf Lechtenfeld,
Prof. Dr. Elmar Schrohe, Prof. Dr. Christoph Walker