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Interpolation properties of anisotropic Nikol'skii-Besov $B_{\mathbf{pr}}^{\alpha\mathbf{q}}(\mathbb{T}^{\mathbf{d}})$ spaces and embedding theorems ¹

Abstract. We study interpolation properties of anisotropic of Nikol'skii-Besov spaces $B_{\mathbf{pr}}^{\alpha\mathbf{q}}(\mathbb{T}^{\mathbf{d}})$ and we obtain limit embedding theorems for anisotropic Nikol'skii-Besov and Lorentz's spaces.

In article we get interpolations theorems for anisotropic Nikol'skii-Besov $B_{\mathbf{pr}}^{\alpha\mathbf{q}}(\mathbb{T}^{\mathbf{d}})$ spaces. Apply its we proofed the embedding of the different metrics, limits theorems for anisotropic Nicol'skii-Besov spaces and the anisotropic Lorentz spaces.

Theorem 1. *Let $\mathbf{1} < \mathbf{p} = (p_1, \dots, p_n) < \mathbf{q} = (q_1, \dots, q_n) < \infty$, $\mathbf{1} \leq \mathbf{r} = (r_1, \dots, r_n)$, $\tau = (\tau_1, \dots, \tau_n) \leq \infty$. Then for $\alpha = (\mathbf{1}/\mathbf{p} - \mathbf{1}/\mathbf{q})\mathbf{d}$ the embedding holds*

$$B_{\mathbf{pr}}^{\alpha\tau}(\mathbb{T}^{\mathbf{d}}) \hookrightarrow L_{\mathbf{qr}}(\mathbb{T}^{\mathbf{d}}).$$

Theorem 2. *Let $\mathbf{1} < \mathbf{q} = (q_1, \dots, q_n) < \mathbf{p} = (p_1, \dots, p_n) < \infty$, $\mathbf{1} \leq \mathbf{r} = (r_1, \dots, r_n)$, $\tau = (\tau_1, \dots, \tau_n) \leq \infty$. Then for $\alpha = (\mathbf{1}/\mathbf{p} - \mathbf{1}/\mathbf{q})\mathbf{d}$ takes place embedding*

$$L_{\mathbf{qr}}(\mathbb{T}^{\mathbf{d}}) \hookrightarrow B_{\mathbf{pr}}^{\alpha\tau}(\mathbb{T}^{\mathbf{d}}).$$

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