Entropy numbers of embeddings of weighted Besov spaces The limiting case

Hans-Gerd Leopold (Friedrich-Schiller-University of Jena/Germany)

The talk presents results of joint work with T. Kühn (Leipzig), W. Sickel (Jena) and L. Skrzypczak (Poznan).

We investigate the asymptotic behaviour of the entropy numbers of the compact embedding

$$\mathrm{id}: \quad B^{s_1}_{p_1,q_1}(\mathbb{R}^d, w) \hookrightarrow B^{s_2}_{p_2,q_2}(\mathbb{R}^d)$$

of the weighted Besov space $B^{s_1}_{p_1,q_1}(\mathbb{R}^d, w)$ into the unweighted space $B^{s_2}_{p_2,q_2}(\mathbb{R}^d)$. The weights which are admissible in our treatment are smooth, strictly positive, and satisfy $\lim_{|x|\to\infty} w(x) = \infty$.
Most important for us will be the choice $w_\alpha(x) = (1+|x|^2)^{\alpha/2}$ for some $\alpha > 0$. In the so called limiting situation, i.e. $\alpha = \left(s_1 - \frac{d}{p_1}\right) - \left(s_2 - \frac{d}{p_2}\right) > \max\left(0, \frac{d}{p_2} - \frac{d}{p_1}\right)$ we give in almost all cases a sharp two-sided estimate.