Winfried Sickel
Mathematisches Institut, Friedrich-Schiller-Universität Jena, Germany

Best m-term approximation and function spaces of dominating mixed smoothness

In this talk we shall discuss best m-term approximation with respect to a tensor product wavelet system in connection with tensor products of univariate Besov spaces. More exactly, we shall investigate the asymptotic behaviour of the widths of best m-term approximation, here denoted by $\sigma_m(Y, X, \Phi)$. In general, if X, Y are quasi-Banach spaces s.t. $Y \hookrightarrow X$ and if $\Phi := (\psi_j)_j \subset X$, then

$$\sigma_m(Y, X, \Phi) := \sup_{\|f\|_Y \le 1} \sigma_m(f, \Phi)_X \,, \qquad m \in \mathbb{N}_0 \,,$$

where

$$\sigma_m(f, \Phi)_X := \inf \left\{ \Big\| f - \sum_{j \in \Lambda} c_j \, \psi_j \Big\|_X : \quad |\Lambda| \le m \,, \quad c_j \in \mathbb{C} \,, \, \Lambda \subset \mathbb{N} \right\} .$$

In our lecture we shall concentrate on $X = L_p(\Omega)$, where Ω is either $\mathbb{R}^d$ or the unite cube in $\mathbb{R}^d$.
Our approach relies on the wavelet characterization of the tensor products of Besov spaces and on the abstract theory of approximation spaces in connection with interpolation theory (in particular real interpolation).
Finally, we shall compare best m-term approximation with optimal linear approximation.