Adaptive Quarklet Tree Approximation: Numerical Experiments

Dorian Vogel
(joint work with S. Dahlke, M. Hovemann and T. Raasch)
Philipps-Universität Marburg

We are concerned with near-optimal approximation of a given function $f \in L_2([0,1])$ with elements of a polynomially enriched wavelet frame, a so-called quarklet frame. Inspired by *hp*-approximation techniques of Binev, we use the underlying tree structure of the frame elements to derive an adaptive algorithm that, under standard assumptions concerning the local errors, can be used to create approximations with an error close to the best tree approximation error for a given cardinality. This poster provides information on the practical implementation and the performance of the quarklet algorithm. In particular, we demonstrate that our approach can be used to achieve inverse-exponential convergence rates (with respect to the degrees of freedom spent) for models of typical solutions of partial differential equations where we expect that adaptive schemes outperform classical uniform schemes.