

# Kernel methods and multiscale approximation

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Reproducing kernel-based methods are a well-established tool for high-dimensional reconstruction problems. Since many approximation problems have an intrinsic multiscale structure, problem-adapted kernels are often not given in a closed form expression but in a (spectral) multiscale decomposition. Hence, to work practically with such kernels, a careful truncation of the infinite expansions is required which preserves the good approximation properties of the kernel-based trial spaces. In this talk, I will discuss the interplay between kernel-based approximation and multiscale decompositions, focusing on applications to regression problems in certain generalized Besov spaces. I will in particular discuss quantitative approximation results and stability properties of regression algorithms based on properly approximated kernel functions. This talk is based on joint work with Michael Griebel and Christian Rieger (both University of Bonn).