

Standard hierarchical matrices for discrete integral operators are connected with local separable approximations. The interplay of separable approximations and optimal discrete and continuous representations are discussed. Beside the local separable approximations there are also global ones, i.e., approximations over much larger domains. Interestingly, the existence of good global approximations are important for an a posteriori recompression of hierarchical matrices. On the other hand, global approximations appear, e.g., in the discussion of matrix functions and Kronecker products.