Improved Estimates for Condition Numbers of RBF Interpolation Matrices

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Interpolation by radial basis functions is a classic topic in multivariate approximation with many applications. In this problem, one encounters linear systems with the kernel matrices of the radial basis functions and it is of some interest to have precise estimates for their condition number. Therefore, estimates have been developed, to obtain bounds on the condition number in terms of the separation radius of the interpolation points. We present new estimates, which build upon extremal Fourier functions. We show that they are very close to optimal.