

Averaged Nyström interpolants for the solution Fredholm integral equations of the second kind

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Abstract

In this talk we explore the application of weighted averaged Gauss quadrature rules, recently proposed in [2] (see also [3]), to the numerical solution of Fredholm integral equations of the second kind,

$$f(y) + \int_{\mathcal{D}} k(x, y) f(x) d\mu(x) = g(y), \quad y \in \mathcal{D}, \quad (1)$$

where the kernel k and right-hand side function g are given, the function f is to be determined, and $d\mu(x)$ is a nonnegative measure supported on a bounded or unbounded domain $\mathcal{D} \subset \mathbb{R}$.

In particular, we focus on the estimate of the error in the Nyström interpolants.

Several iterative methods are also presented and numerical tests showing the performance of the proposed approaches are discussed.

Keywords: Fredholm integral equations of the second kind, Gauss quadrature rule, Averaged quadrature rule, Nyström method.

References

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