On the Construction of Fully Discrete Collocation Methods for Integral Equations with Singularities

Arvet Pedas*,   Mikk Vikerpuur

Abstract

To find the approximate solutions to second kind linear integral equations by a collocation method, it is necessary to solve linear algebraic systems consisting of integrals which cannot in general be computed exactly. Following some ideas of [1], we construct a fully discrete method for solving integral equations with diagonal and boundary singularities, where the integrals appearing in the collocation system are approximated by suitable quadrature formulas on appropriate nonuniform grids. The attainable convergence rate of the proposed scheme is studied and verified by some numerical experiments.

References

[1] Enn Tamme, *FULLY DISCRETE COLLOCATION METHOD FOR WEAKLY SINGULAR INTEGRAL EQUATIONS*, Proc. Estonian Acad. Sci. Phys. Math., 50 (2001), 133–144.

---

*   University of Tartu. Narva street 18, Tartu, Estonia; email: `arvet.pedas@ut.ee`