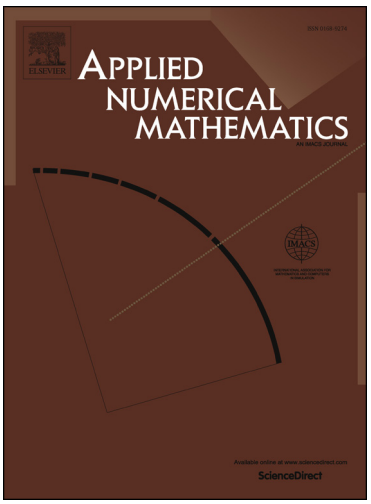
Accepted Manuscript



Discrete Modified Projection Method for Urysohn Integral Equations with Smooth Kernels

Rekha P. Kulkarni, Gobinda Rakshit

PII: S0168-9274(17)30258-1
DOI: https://doi.org/10.1016/j.apnum.2017.12.008
Reference: APNUM 3293

To appear in: *Applied Numerical Mathematics*

Received date: 21 September 2017
Revised date: 13 December 2017
Accepted date: 14 December 2017

Please cite this article in press as: R.P. Kulkarni, G. Rakshit, Discrete Modified Projection Method for Urysohn Integral Equations with Smooth Kernels, *Appl. Numer. Math.* (2018), https://doi.org/10.1016/j.apnum.2017.12.008

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Discrete Modified Projection Method for Urysohn Integral Equations with Smooth Kernels

Rekha P. KULKARNI *and Gobinda RAKSHIT †

Abstract

Approximate solutions of linear and nonlinear integral equations using methods related to an interpolatory projection involve many integrals which need to be evaluated using a numerical quadrature formula. In this paper, we consider discrete versions of the modified projection method and of the iterated modified projection method for solution of a Urysohn integral equation with a smooth kernel. For $r \geq 1$, a space of piecewise polynomials of degree $\leq r-1$ with respect to an uniform partition is chosen to be the approximating space and the projection is chosen to be the interpolatory projection at r Gauss points. The orders of convergence which we obtain for these discrete versions indicate the choice of numerical quadrature which preserves the orders of convergence. Numerical results are given for a specific example.

Key Words : Urysohn integral operator, Interpolatory projection, Gauss points, Nyström Approximation

AMS subject classification : 45G10, 65J15, 65R20

*Department of Mathematics, I.I.T. Bombay, Powai, Mumbai 400076, India, rpk@math.iitb.ac.in,
†gobindarakshit@math.iitb.ac.in

Download English Version:

https://daneshyari.com/en/article/8902693

Download Persian Version:

https://daneshyari.com/article/8902693

Daneshyari.com