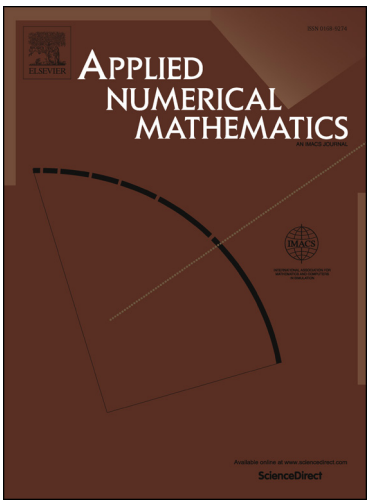
Accepted Manuscript



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PII: S0168-9274(16)30200-8
DOI: http://dx.doi.org/10.1016/j.apnum.2016.10.006
Reference: APNUM 3112

To appear in: *Applied Numerical Mathematics*

Please cite this article in press as: F.D. d' Almeida, R. Fernandes, Projection methods based on grids for weakly singular integral equations, *Appl. Numer. Math.* (2016), http://dx.doi.org/10.1016/j.apnum.2016.10.006

Projection methods based on grids for weakly singular integral equations

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Abstract

For the solution of a weakly singular Fredholm integral equation of the 2nd kind defined on a Banach space, for instance $L^1([a,b])$, the classical projection methods with the discretization of the approximating operator on a finite dimensional subspace usually use a basis of this subspace built with grids on $[a,b]$. This may require a large dimension of the subspace. One way to overcome this problem is to include more information in the approximating operator or to compose one classical method with one step of iterative refinement. This is the case of Kulkarni method or iterated Kantorovich method. Here we compare these methods in terms of accuracy and arithmetic workload. A theorem stating comparable error bounds for these methods, under very weak assumptions on the kernel, the solution and the space where the problem is set, is given.

Keywords: Projection approximations in L^1, weakly singular integral operators, error bounds.

2000 MSC: 65J10, 65R20.

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