

Accepted Manuscript

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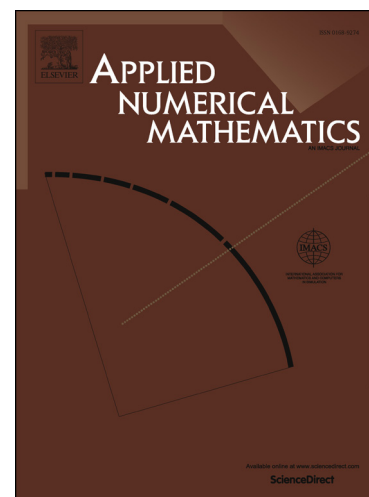
PII: S0168-9274(17)30266-0
DOI: <https://doi.org/10.1016/j.apnum.2017.12.016>
Reference: APNUM 3301

To appear in: *Applied Numerical Mathematics*

Received date: 16 April 2017
Revised date: 3 December 2017
Accepted date: 22 December 2017

Please cite this article in press as: D. Barrera et al., Two methods based on bivariate spline quasi-interpolants for solving Fredholm integral equations, *Appl. Numer. Math.* (2018), <https://doi.org/10.1016/j.apnum.2017.12.016>

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Two methods based on bivariate spline quasi-interpolants for solving Fredholm integral equations [★]

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Abstract

For solving a Fredholm integral equation of the second kind, we approximate its kernel by two types of bivariate spline quasi-interpolants, namely the tensor product and the continuous blending sum of univariate spline quasi-interpolants. We give the construction of the approximate solutions, and we prove some theoretical results related to the approximation errors of these methods. We illustrate the obtained results by some numerical tests giving a comparison with several methods in the literature.

Key words: Fredholm integral equation, Spline quasi-interpolant, Tensor product, Blending sum.

Mathematics Subject Classification (2000): 65R20, 65D07, 65D30.

1 Introduction

In this paper, we are interested in the approximation of the solution of the following Fredholm integral equation of the second kind

$$u(x) = f(x) + \int_a^b k(x, t) u(t) dt, \quad x \in I := [a, b]. \quad (1.1)$$

[★] Research supported by URAC05 (Morocco) and FQM-191 (Junta de Andalucía, Spain).

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