

NUMERICAL EVALUATION OF RETARDED POTENTIALS

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ABSTRACT. We focus on the numerical evaluation of retarded potentials. We present a composite quadrature rule (which converges exponentially fast) together with an optimal grading strategy. Our error analysis in [1] is based on regularity results for the retarded potential in countably normed spaces as derived in [2]. The computation of the matrix entries in a marching-on-in-time scheme corresponding to the discretization of a space-time variational formulation of retarded potential integral equations involves the numerical approximation of a special class of integrals. These integrals can be understood as a composition of double integrals over triangles intersected with domains of influence determined by the time discretization, see also [3]. We also give numerical results which underline our theoretical results.

Keywords: retarded potential, composite quadrature, exponential convergence, regularity

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