

Stable quadrature rules for qualocation [✓]

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Abstract

In previous papers, the qualocation method has been introduced and applied to a large class of boundary integral equations on smooth curves in the plane. Here we study the stability of this method and of tolerant qualocation as well.

I. H. Sloan and W. L. Wendland analysed thoroughly qualocation with spline trial and test spaces in the paper 'Qualocation methods for elliptic boundary integral equations' (1998). They derived a criterion for stability and computed numerically weights and knots for some methods which are suitable for equations in which the even symbol part of the operator dominates and other methods for a dominant odd part. Stability of these methods was ensured by numerical computations.

We simplify their stability result yielding a representation which allows to prove which J -point quadrature rules are leading to stable qualocation and which are not. Furthermore, the existence of at least one stable method follows for any J .