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Prößdorf, Siegfried, Weierstraß-Institut, Berlin, Germany

Boundary element methods using multiwavelets

We consider Galerkin-Petrov schemes using multiwavelets as trial and test functions (covering classical Galerkin methods and collocation) for approximately solving integral and periodic pseudodifferential equations. Necessary and sufficient conditions for their stability are established in terms of the principal symbol of the pseudodifferential operator and the Fourier transforms of the generating multiscaling functions and of the test functionals. Optimal error estimates in the scale of Sobolev norms will be presented. Part of these results is joint work with W. McLean and J. Schult. It generalises and completes well known properties of boundary element methods using splines or classical wavelets.

Reference: S. Prössdorf, J. Schult, Approximation and commutator properties of projections and applications to boundary integral equations, *J. Integral Equations Appl.* (to appear).