Adaptive BEM for Mixed Boundary Value Problems

FRI/P2
16:30–16:50

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In our talk, we consider an adaptive BE scheme for the equivalent integral formulation of the Laplace equation in 2D with mixed boundary conditions. In the proposed scheme, the given boundary data and the non-homogeneous volume force are appropriately approximated by piecewise polynomials. Besides the possible singularities of the (in general unknown) solution, the adaptive mesh-refinement aims at a sufficient resolution of the data. We prove that the adaptive algorithm drives an extended estimator quantity, given as sum of an $h - h/2$-type error estimator and data oscillations, to zero. Under certain assumptions, this implies that the sequence of (computed) discrete solutions, in fact, tends to the (unknown) exact solution.

[1] M. AURADA, S. FERRAZ-LEITE, D. PRAETORIUS: Estimator reduction and convergence of adaptive FEM and BEM. submitted for publication (2009).
[2] M. AURADA, P. GOLDENITS, D. PRAETORIUS, I. ROTH: Adaptive BEM for some mixed boundary value problem. work in progress (2009).
[3] G. OF, O. STEINBACH, P. URTHALER: Fast evaluation of Newton potentials in the boundary element method. Preprint 2008/3, Institute for Numerical Mathematics, Graz University of Technology, 2008.