

Contents

1	The coupling of BEM and FEM for linear problems.....	1
1.1	Introduction.....	1
1.2	The basic idea of coupling.....	4
1.3	One boundary integral equation approach.....	6
1.4	The exterior Stokes problem.....	10
1.5	Two boundary integral equations approach.....	17
1.6	The linear elasticity problem.....	20
1.7	Quasi-symmetric scheme.....	24
2	Monotone nonlinear problems.....	31
2.1	Introduction.....	31
2.2	The nonlocal boundary problem.....	32
2.3	The weak formulation.....	38
2.3.1	Preliminaries.....	38
2.3.2	The weak formulation and the operator equation.....	41
2.4	Some known results on monotone operators.....	51
2.5	Existence and uniqueness.....	55
2.6	Galerkin approximations of the operator equation.....	61
3	Asymptotic error analysis.....	67
3.1	Introduction.....	67
3.2	Preliminaries.....	67
3.3	Triangulations of the domain and their properties.....	71
3.4	The finite element discretizations.....	74
3.4.1	The discrete problem on $\bar{\Omega}_h$	75
3.4.2	The discrete problem on $\bar{\Omega}$	78
3.5	Convergence analysis and error estimates.....	85
4	An elasto-plastic problem.....	95

4.1	Introduction.....	95
4.2	A generalized variational formulation.....	95
4.3	Existence, uniqueness and Galerkin approximations.....	101
4.4	The elasto-plastic interface problem.....	107
5	Nonmonotone nonlinear problems.....	128
5.1	Introduction.....	128
5.2	Some preliminary concepts.....	129
5.3	The two integral equations approach.....	131
5.4	The single integral equation approach.....	140
5.5	An example.....	148
6	The uncoupling of BEM and FEM for nonlinear problems.....	150
6.1	Introduction.....	150
6.2	The uncoupling of BIM and FEM.....	151
6.3	The uncoupling method for monotone nonlinear problems.....	155
6.4	The uncoupling method for nonmonotone nonlinear problems.....	167
References.....		172