

Roles of hypersingularity in boundary element method

complementary constraints

higher order element

1. Hermite element

degenerate boundary

1. cutoff wall
2. sheet pile
3. crack
4. baffle
5. thin airfoil
6. antenna

$$(o) \begin{cases} [U](t)=[T](u) \\ [L](t)=[M](u) \end{cases}$$

$$(o) \begin{cases} [L](t)=[M](u) \\ [U](t)=[T](u) \end{cases}$$

$$(x) \begin{cases} [L](t)=[M](u) \\ [L](t)=[M](u) \end{cases}$$

$$(x) \begin{cases} [U](t)=[T](u) \\ [U](t)=[T](u) \end{cases}$$

corner problem

1. $\begin{cases} [U](t)=[T](u) \\ [L](t)=[M](u) \end{cases}$
2. $\begin{cases} [U](t)=[T](u) \\ [L](t)=[M](u) \end{cases}$
3. $\begin{cases} [L](t)=[M](u) \\ [L](t)=[M](u) \end{cases}$

fictitious eigenvalue

1. kernel function
2. region of singularity
3. boundary condition

adaptive BEM

1. error estimator

secondary field calculation

1. hoop stress on boundary
2. tangent flux along boundary
3. regularized version for stress near boundary

Tikhonov regularization for inverse prob.

condition number

1. pseudo-differential operator
- | | |
|---------|--------|
| $U(-1)$ | $T(0)$ |
| $L(0)$ | $M(1)$ |
2. T, L is more stable than U, M

eigen problem using MRM

1. augmented eigenvalues
2. trivial mode

symmetry formulation

1. double boundary integration

image system

1. normal vector of dipole or dislocation

The roles of hypersingularity in boundary element method

