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The regularized indirect algorithm in BEM for calculating values on and near boundaries

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Summary

The calculation of field values and their derivatives near the domain boundary through the boundary element method (BEM) will meet the nearly singularity problem, i.e. the boundary layer effect problem. The tangential derivatives of field values on the boundary often meet an obvious deduction of calculation accuracy. An effective algorithm was proposed by Chen et al. [1,2] to treat these two problems in the same time in elastic BEM and it was recently extended to calculate the second derivative values in potential problem [3]. This algorithm is based on the regularized formulations and is now called the regularized indirect algorithm. This talk presents a system introduction of this algorithm and shows how it works for this conventional but still important problem in the boundary element method.

Keywords: boundary element method, boundary layer effect, tangential derivative, second derivatives, regularized formulation

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